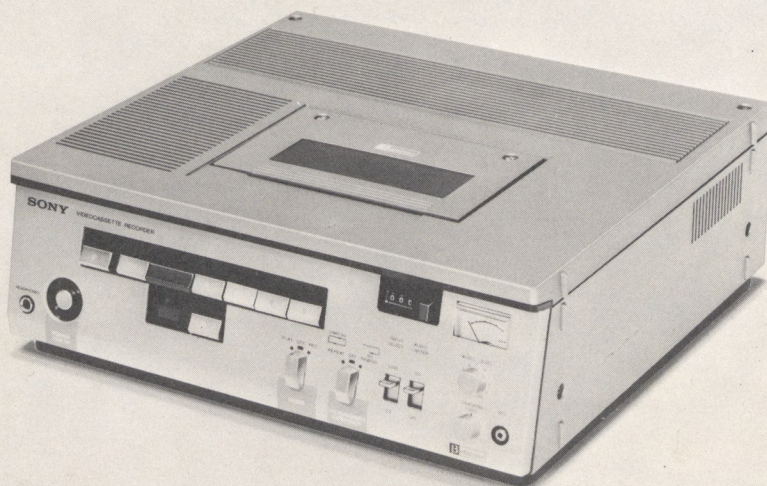




## SPECIFICATIONS

### GENERAL

|                                |                                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Video recording system:</b> | Rotary two-head helical scanning                                                                    |
| <b>Video signal:</b>           | EIA standards, NTSC color                                                                           |
| <b>Storage temperature:</b>    | -20°C to +60°C (-4°F to 140°F)                                                                      |
| <b>Operating temperature:</b>  | 5°C to 40°C (41°F to 104°F)                                                                         |
| <b>RF output signal:</b>       | US channel 3 or 4, depending upon the selected operating channel of the RF unit<br>F-type connector |
| <b>Power requirements:</b>     | 120V ac $\pm$ 10%, 50/60Hz                                                                          |
| <b>Power consumption:</b>      | 55W                                                                                                 |
| <b>Weight:</b>                 | 12.5kg (27lb 9oz)                                                                                   |
| <b>DC power output:</b>        | 6.5V max. 0.4A dc (from REMOTE connector pin-1)                                                     |
| <b>Dimensions:</b>             | 392 x 353 x 148mm<br>(15 1/2 x 13 7/8 x 5 7/8 inches) (w/h/d)                                       |

### VIDEO

|                               |                                                                                                                             |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Input:</b>                 | 1.0V(p-p) $\pm$ 0.5V(p-p), 75 ohms<br>unbalanced, sync negative<br><b>LINE:</b> BNC connector<br><b>TV:</b> 8-pin connector |
| <b>Output:</b>                | 1.0V(p-p) $\pm$ 0.1V(p-p), 75 ohms<br>unbalanced, sync negative<br><b>LINE:</b> BNC connector<br><b>TV:</b> 8-pin connector |
| <b>Horizontal resolution:</b> | Monochrome: 300 lines<br>Color: 240 lines                                                                                   |
| <b>Signal-to-noise ratio:</b> | Better than 43dB                                                                                                            |

### AUDIO

|               |                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input:</b> | <b>LINE:</b> more than 100k ohms, -10dB<br>Mini jack<br><b>TV:</b> more than 100k ohms, -20dB<br>8-pin connector<br><b>MIC:</b> -60dB, suitable for low-impedance microphone<br>Mini jack |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                                                                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Output:</b> | <b>LINE:</b> less than 2k ohms, -5dB (100k ohm load), unbalanced<br>Mini jack<br><b>TV:</b> less than 20k ohms, -5dB (100k ohm load), unbalanced<br>8-pin connector<br><b>HEADPHONES:</b> 8 ohms, -27dB<br>Phone jack |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                               |                         |
|-------------------------------|-------------------------|
| <b>Frequency response:</b>    | 50 to 10,000Hz          |
| <b>Signal-to-noise ratio:</b> | Better than 45dB        |
| <b>Audio distortion:</b>      | Less than 3% (at 333Hz) |

### TAPE TRANSPORT

|                                |                                   |
|--------------------------------|-----------------------------------|
| <b>Tape speed:</b>             | 4.0cm/sec                         |
| <b>Maximum recording time:</b> | 60min. (with Sony L-500 cassette) |
| <b>Fast-forward time:</b>      | Within 3 1/2 min. (L-500)         |
| <b>Rewind time:</b>            | Within 3 1/2 min. (L-500)         |

### ACCESSORIES SUPPLIED

Videocassette tape L-250 (30min.)  
RF unit (US channel 3 or 4, selectable, built into the recorder)  
External antenna connector EAC-20W or ECA-24 (75-ohm to 300-ohm matching transformer)  
Antenna selector ANS-20  
75-ohm coaxial cables with F-type plugs (0.5m, 1.5m)  
Dust cover

### OPTIONAL ACCESSORIES

Auto search control RM-300  
Remote controls RM-420 and RM-410  
Automatic editing control units RM-400 and RM-430  
Digital timers DT-32 (for the USA) and DT-30 (for Canada)

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# SECTION 1

## GENERAL DESCRIPTION

### • FEATURES

#### Automatic control of video recording level

The automatic gain control circuits maintain proper video level, assuring optimum video recording.

#### Manual control of audio recording level, limiter recording system

Audio level may be controlled manually. A level meter indicates the signal level. When the AUDIO LIMITER switch is set to ON, high-level peaks are reduced to prevent tape saturation and distortion without audibly altering the dynamic range of the recording.

#### Audio dubbing

Audio (commentary, music, etc) may be added to video recordings made earlier.

#### Editing capability

- The capstan servo system utilized in this recorder, monitors and controls the tape speed, assuring precise editing and a stable picture with minimum jitter.
- A drop-out compensator and a noise eliminator assure faithful reproduction of the recorded picture.
- For quick and precise editing, an automatic editing control unit is available as an optional accessory.

#### Remote control

Operation from a remote location is possible with the use of a remote control unit (optional).

Particular segments of a tape may be played from a remote location using an RM-300 auto search control (optional).

#### Logic control

The operating mode can be changed without the requirement of pressing the STOP button between modes. Solenoid-operated controls are feather light to the touch.

#### Automatic transport operation

The PROGRAMMED OPERATION selector permits automatic repeat- or rewind-operation.

#### Playback into a conventional TV receiver

The picture and sound of a recorded videocassette may be played on a regular TV.

#### Timer recording

With the aid of a timer (optional), TV recordings may be made while the recorder is unattended.

#### Still picture

The tape may be momentarily stopped in the record, audio dub or playback mode. A still picture is displayed in the pause mode.

#### Full auto rewind

At the end of the tape, the transport stops and automatically fully rewinds.

#### Power line frequency

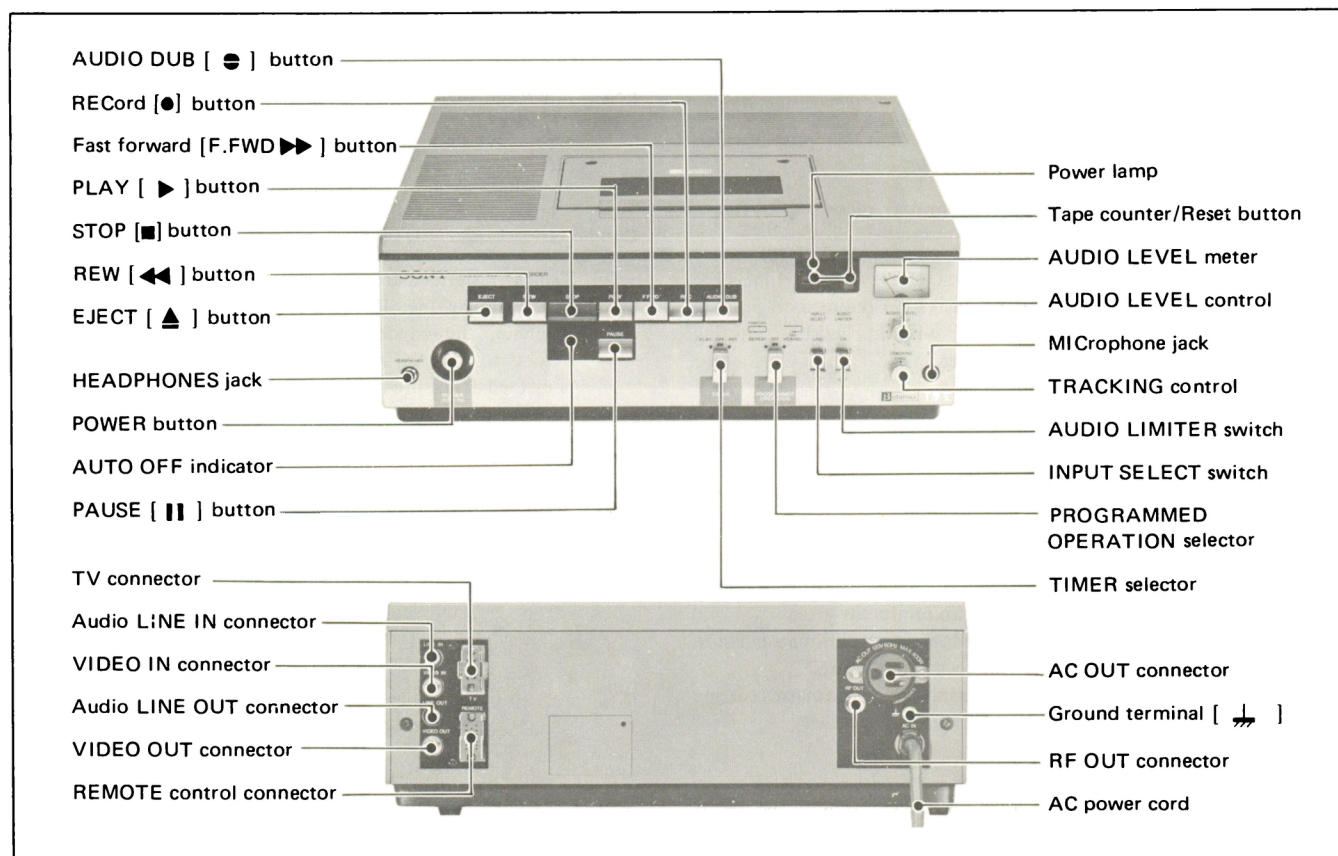
This machine is free from 50 or 60Hz power line frequency difference, and is readily operated on both power line frequency without any internal modification.

#### Condensation sensor/AUTO-OFF indicator

Tape is protected from possible damage due to condensation inside a machine. If condensation should occur inside the machine, the condensation sensor system of the machine detects so that the AUTO-OFF lamp is lit and that a cassette is ejected from the machine automatically. The condensation is started to remove with fans and thermo heater. The machine will not accept cassette as long as AUTO-OFF lamp lights. The AUTO-OFF lamp turns off as soon as the condensation is removed.

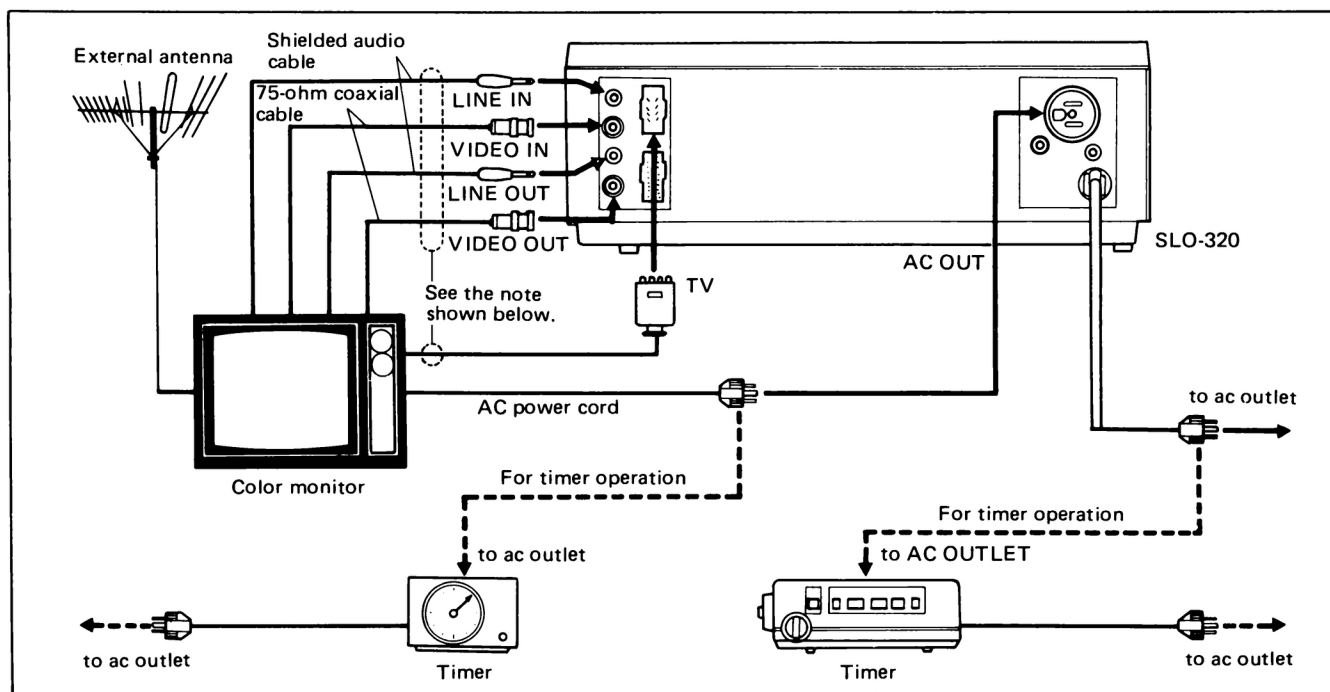


# • LOCATION OF PARTS AND CONTROLS



## • CONNECTIONS

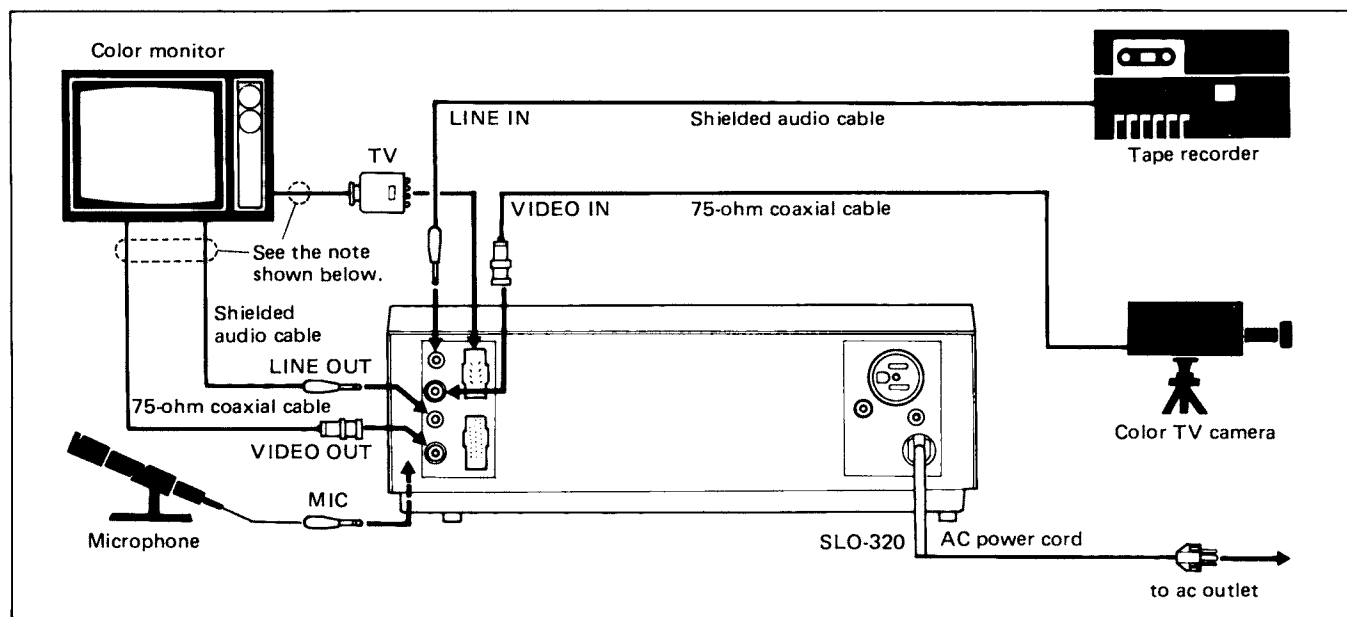
### System Connection for TV Recording



#### Note:

- For monitors equipped with a matching 8-pin connector, the single cable between the monitor and recorder provides all audio and video input and output connections.

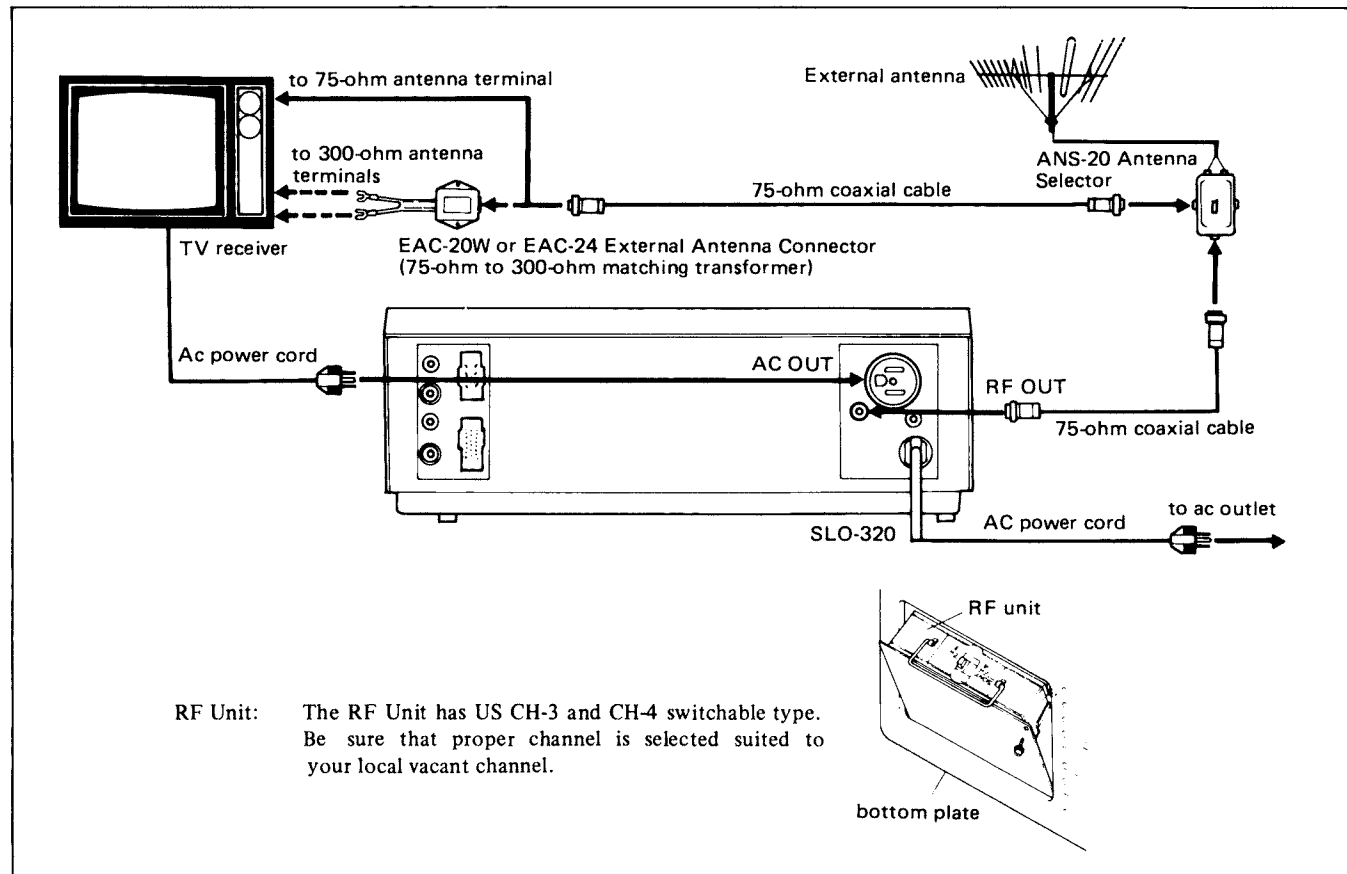
## System Connection for Camera Recording



## Notes:

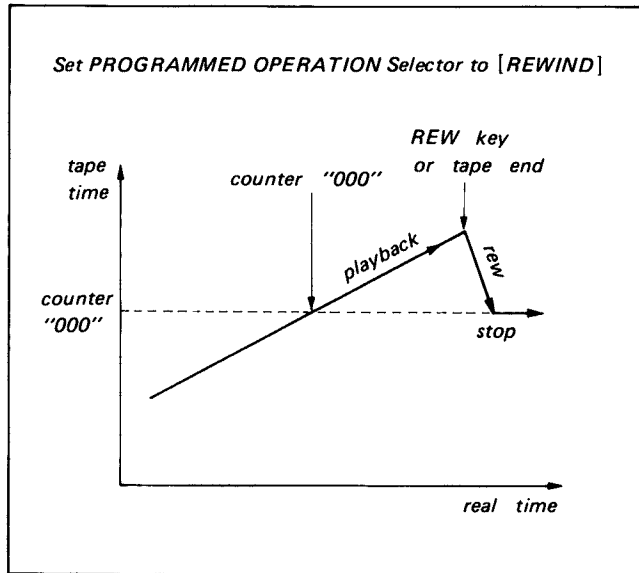
- Cameras must conform to American TV (EIA) standards and have its own internal sync source that provides 2 : 1 interlace singals.
- For monitors equipped with a matching 8-pin connector, the single calbe between the monitor and recorder provides all audio and video output connections.
- Set the INPUT SELECT switch on the front panel to LINE position.
- To prevent hum in the audio, connect the ground terminal [  ] to an earth ground.
- If the MIC and LINE jacks are connected simultaneously, the MIC jack has priority; audio from the LINE jack will not be recorded.

## Connection for Playback on a TV Receiver

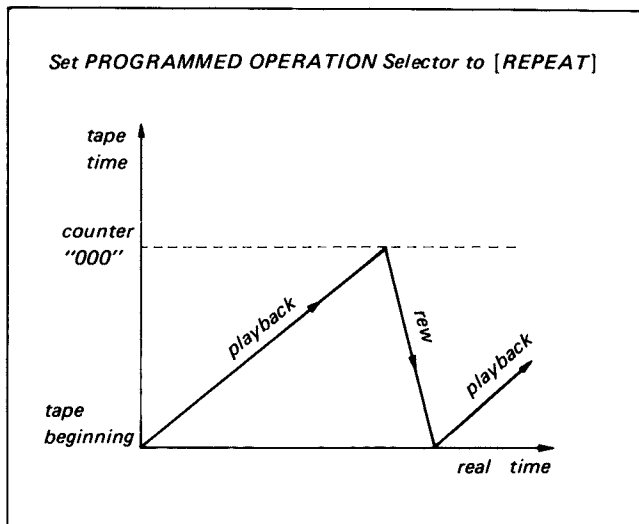


## • PROGRAMMED OPERATION

### Programmed REWIND operation



### Programmed REPEAT operation



### Full repeat operation

Once tape is fully rewound to the tape beginning, press then the counter reset button to [000]. Set the PROGRAMMED OPERATION Selector to the REPEAT position. Play back the tape then, that is shuttle between tape beginning and end.

## • REMOTE CONTROL CONNECTION

**Note:** When using a remote control unit, set both the TIMER switch and PROGRAMMED OPERATION switch on the SLO-320 control panel to their OFF positions.

### Connection with RM-300, RM-410, RM-420

Connection of these remote controls and SLO-320 has no problem, at all.

### RM-430 connection

A SLO-320 or SLP-300 machine can be used as a master playback machine as connected with RM-430, while a SLO-320 or U-MATIC is used as a recording machine, so that ASSEMBLE editing is performed.

But 1) RM-430 rear panel REVERSE select switch should be set in OFF position when it is connected to SLO-320/SLP-300.

2) The FWD 1/20 Button functions as PLAY Button.

### RM-400 connection

A RM-400 cannot accept two Betamax SL machines for recorder machine and playback machine because of maximum allowable current limitation of RM-400.

This connection should not be made.

(ex) master playback SLP-300 or SLO-320  
slave recording SLO-320.

However, it is possible to connect U-MATIC recorder as slave machine and SLO-320/SLP-300 as master playback, so that ASSEMBLE editing is performed.

### RM-444 connection

Single unit of SLP-or SLO-machine should not be connected to RM-444. More than two units of SLP-or SLO-machine should be connected simultaneously to RM-444.



## SECTION 2

### CAUTIONS AND OTHER INFORMATION

#### 2-1. CAUTION ON SERVICE WORK

1. Never to place the machine with the fan (black) attached on the top of the head drum upside/down after the upper lid of the cabinet has been removed. (Since the fan is projected from the chassis face, an immoderate force is applied on the drum if the set is placed upside/down, giving an adverse influence on the tape running, tape interchangeability, etc.)
2. Be sure to attach the fan on top of the drum, prior to the playback check of the tape or the electric system alignment. If the check or alignment is done without the fan attached, the picture bends on the monitor as shown in Fig.2-1.
3. Make sure to use the KR5-1 alignment tape for the alignment of this machine. Never to use the KR5-1L or the KR5-1D.
4. It is recommended to utilize the screwdriver only for the TOTSU type screws (⊕) used in this machine for increasing the productivity.

| screw size | part number      |
|------------|------------------|
| 2.6 mm dia | ) ; 7-721-050-63 |
| 3 mm dia   |                  |
| 4 mm dia   | ; 7-721-050-64   |

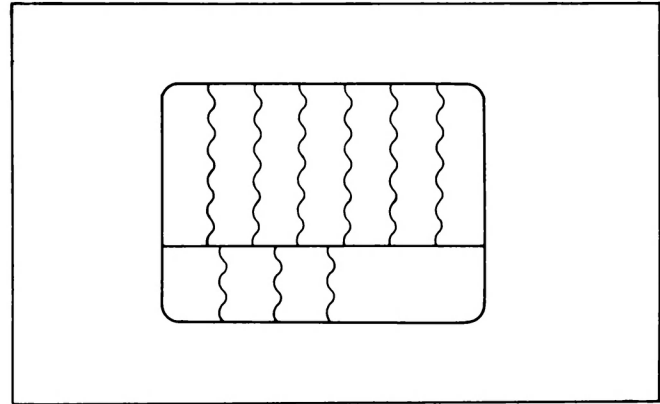
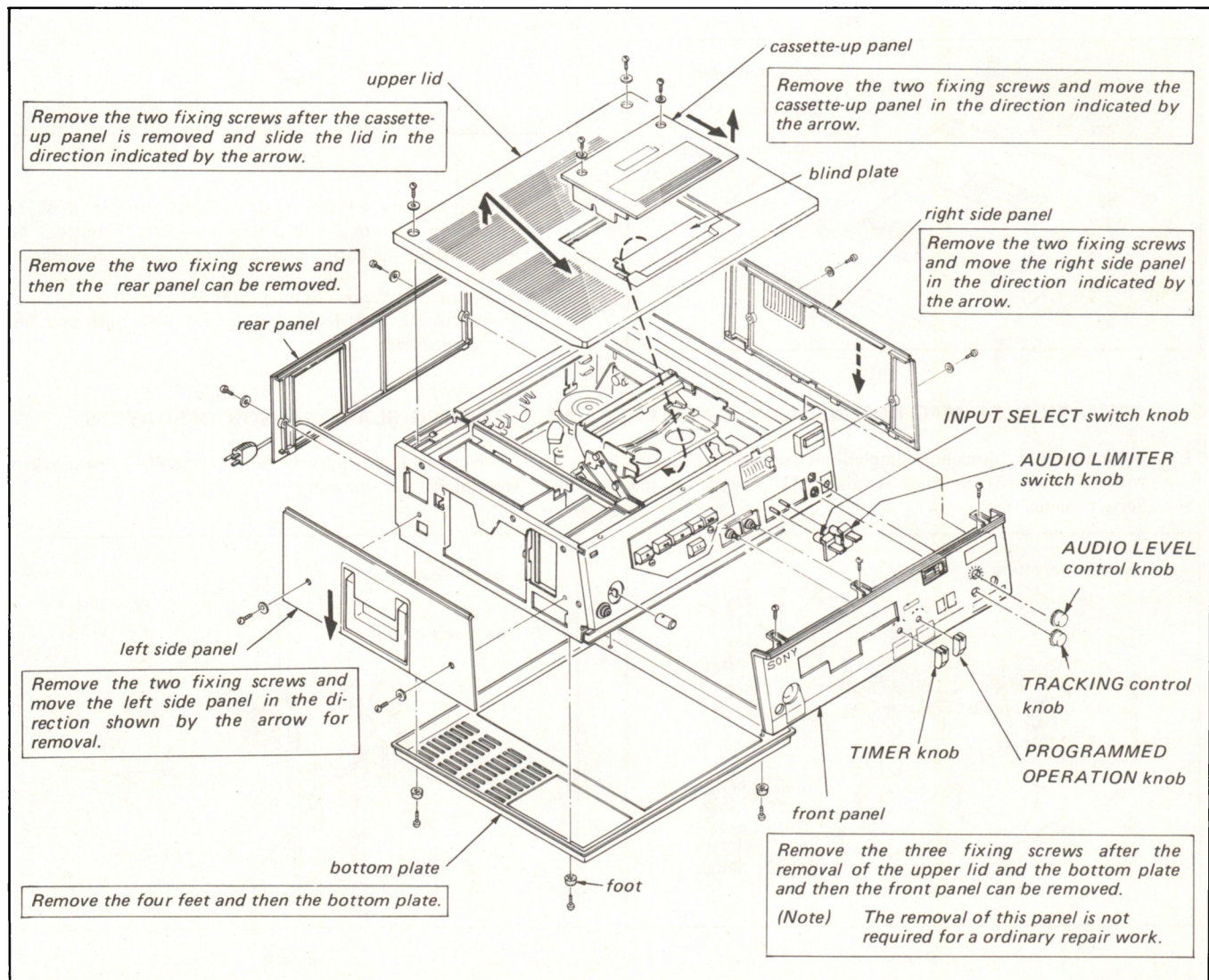


Fig. 2-1.

#### 2-2. DISASSEMBLY AND ASSEMBLY OF CABINET

##### 2-2-1. Removal of Cabinet



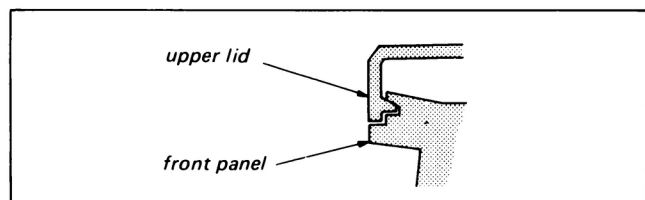


## 2-2-2. Cabinet Assembly

Reverse the disassembly procedure described in Section 2-2-1 for assembling the cabinet (slide the lid, the right and left side panels, and the cassette-up panel in the opposite directions with the arrows in the figure). The followings must be noted for the assembling.

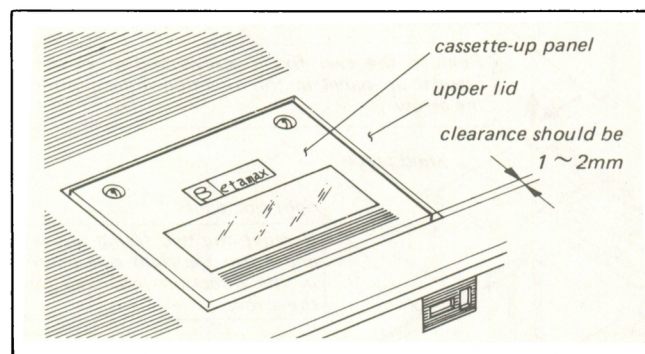
Notes for upper lid attachment

- (i) The blind plate must be inserted under the cassette-up assembly as shown by the dotted line while the cassette-up assembly is raised.
- (ii) The upper lid must be fixed with the two fixing screws after it is fit into the front panel as shown in the figure below.



Note for cassette-up panel attachment

- (i) The cassette-up panel must be attached so that the clearance between the panel and the upper lid is 1 to 2 mm.



## 2-3. OPERATION OF MACHINE WITHOUT CASSETTE

1. Setting up the "threading-completion-state" of the machine without cassette. (This state is called "STOP mode" in this Service Manual.)

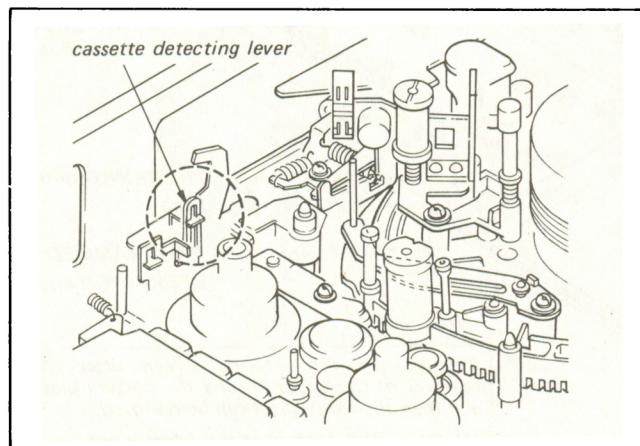


Fig. 2-3.

Press the cassette detecting lever until the threading ring stops.

2. Setting up the PLAY, F.FWD, or REW mode without cassette.  
Clip the cassette detecting lever with a clip as shown in Fig. 2-4 so as to place the cassette-in micro-switch mounted on the SY-24 board into the on-state. The machine can be placed into a desired mode by depressing the function button corresponding to the mode. For setting up the PLAY state, the PLAY button must be pressed after stopping the slack-tape sensor, following the procedure stated in Section 2-4.

**Note:** Never perform EJECT by this manner. EJECT must be done by the manner mentioned below.

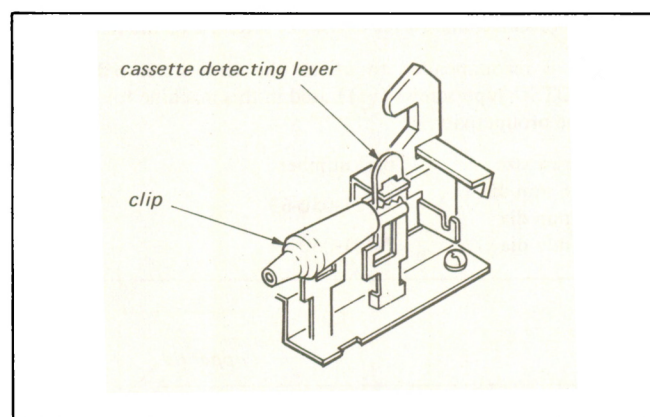


Fig. 2-4.

3. Setting up the EJECT mode without cassette. Push the cassette-in detecting lever, press the EJECT button, and keep pushing the button until unthreading is accomplished.
4. How to set up the record mode without a cassette. Push the REC or DUB button and then push and hold the mis-rec lever.

## 2-4. STOPPING SLACK SENSOR OPERATION

1. Insert a pencil lead into the hole on the PD-7 board so as to stop the slack sensor arm.

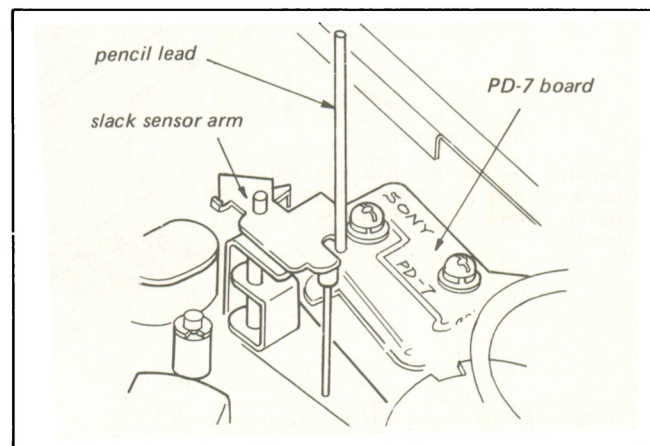
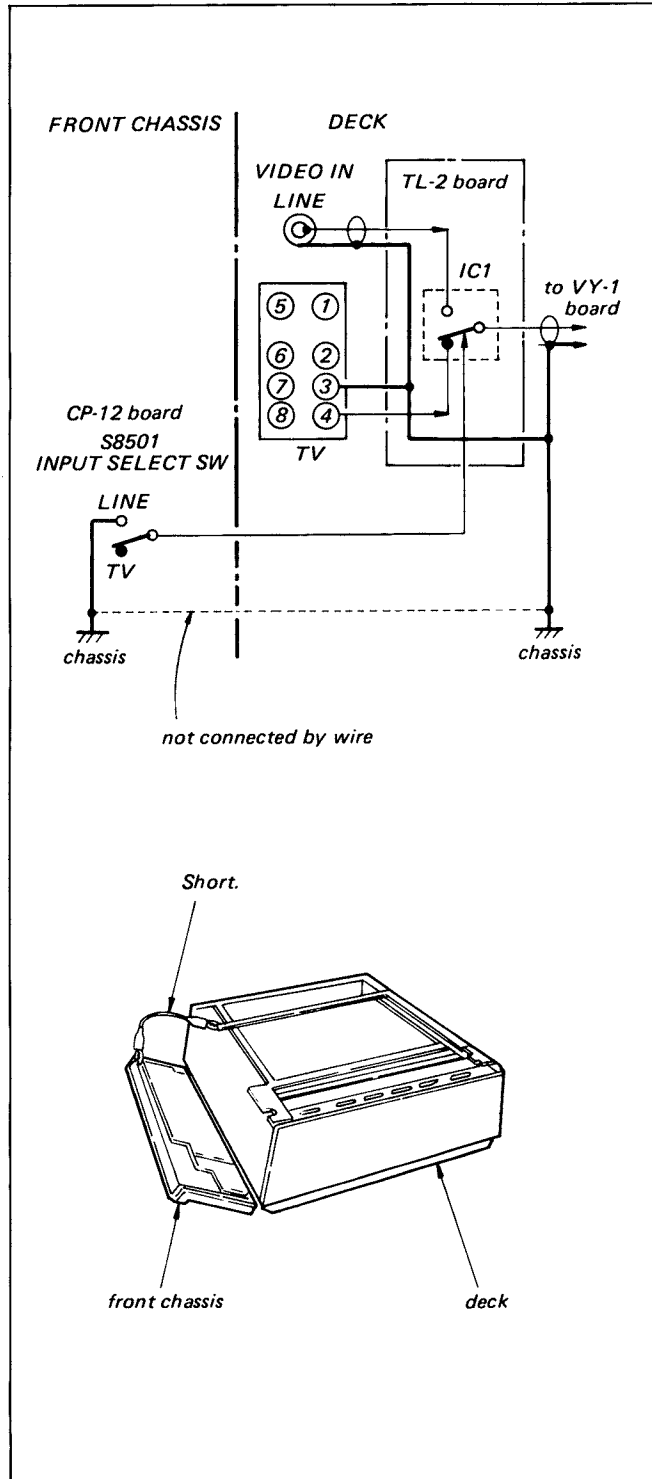


Fig. 2-5.

## 2-5. DISASSEMBLY OF FRONT CHASSIS (FAULTY OPERATION OF VIDEO INPUT SELECTOR)

When disassembling the front chassis should be removed from the machine as in repair work, the TV video input signal that is fed from 8-pin square connector is selected regardless of the INPUT SELECT switch's position. If the video line input signal that is fed from BNC connector is necessary, short between the front panel's chassis and the deck's chassis.

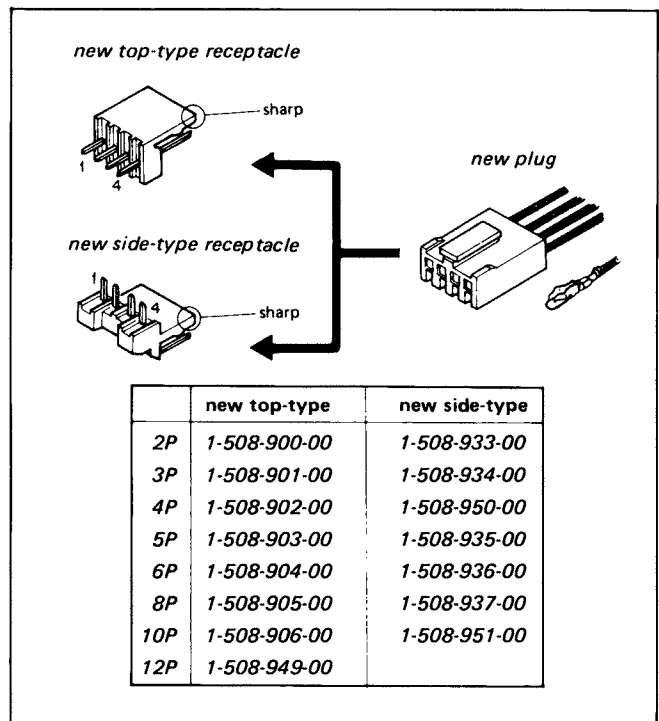
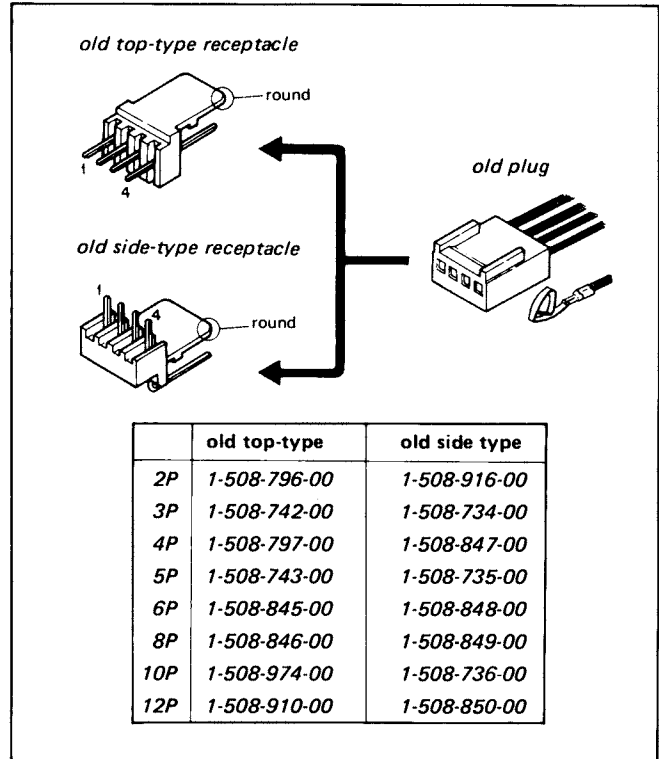


## 2-6. CONNECTORS FOR P.W. BOARD

### 2-6-1. Part Change for Improvement of Reliability

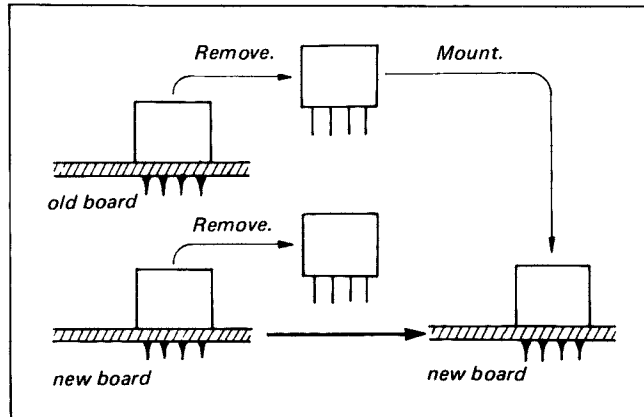
In order to improve the reliability of connection, several types of printed wiring board connector (receptacle and plug) are changed in SLO-320.

However they are not interchangeable.

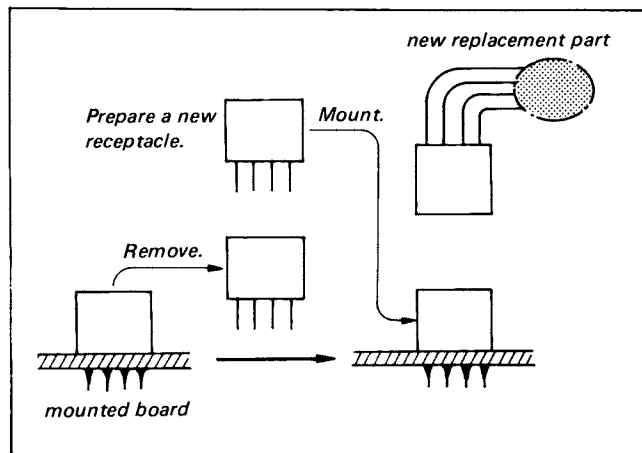


When replacing a mounted board or a part with connector, there is a case that the plug cannot be connected to the receptacle on the mounted board. In the case, employ the following technique.

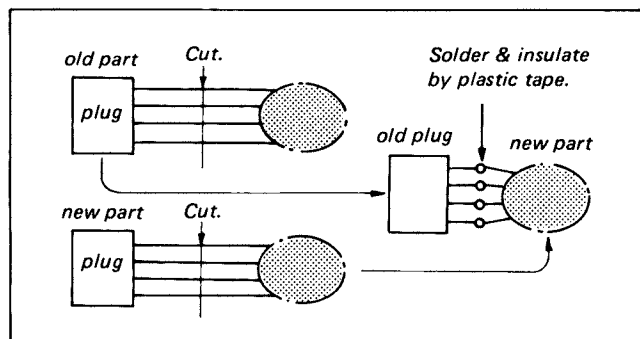
1. When the receptacles on the new board and on the old board; Remove the receptacles from the new board and old board. Mount then the receptacle that is removed from old board, onto the new board.



2. When the plug that are wired to the new part and the old part are different, employ either following 2-1 or 2-2.
- 2-1. Replace the receptacle on the mounted board to other type of receptacle that matches the plug of the new replacement part.

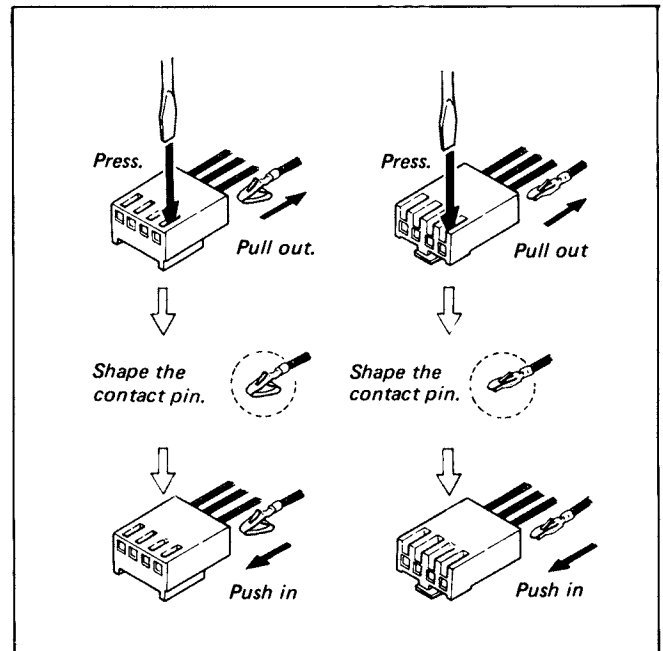


- 2-2. Or, cut out the plugs of the new replacement part and the old part. Solder then the old plug to the new part.

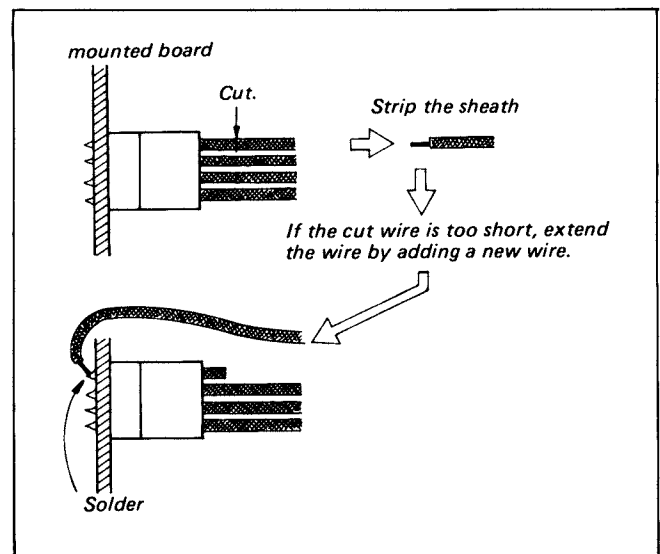


## 2-6-2. How to Repair the Faulty Connection

1. By shaping the contact of plug.

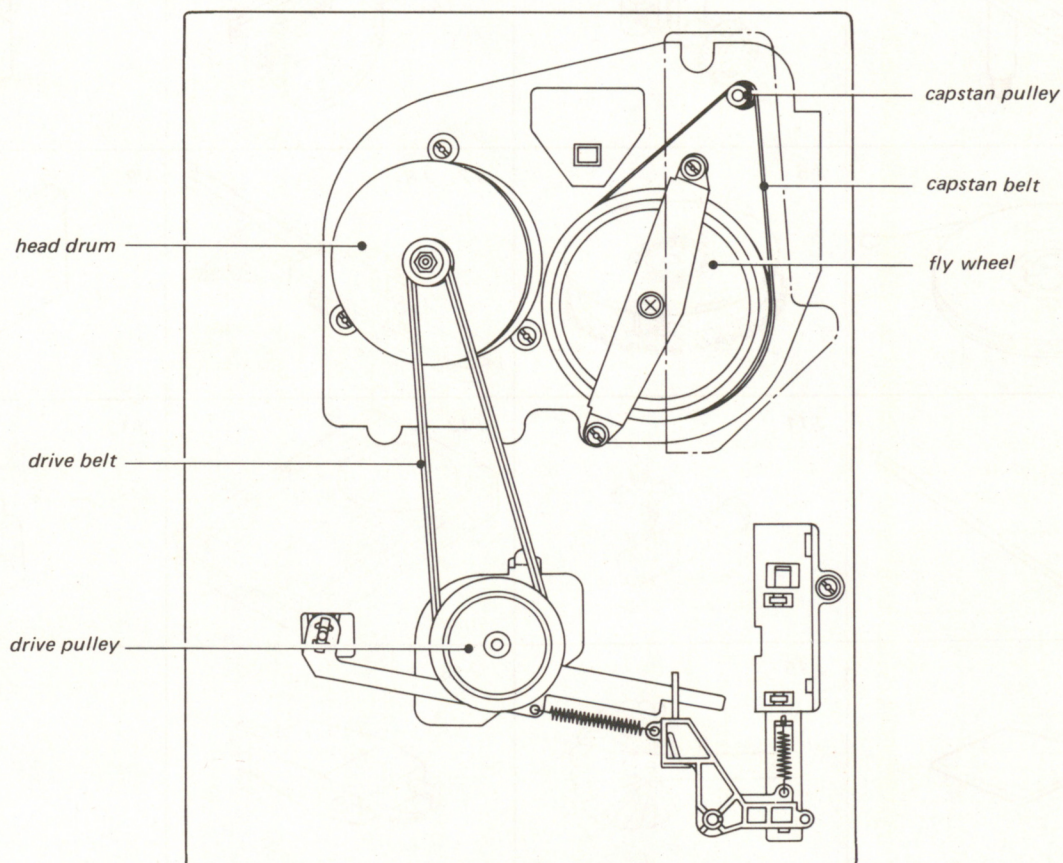
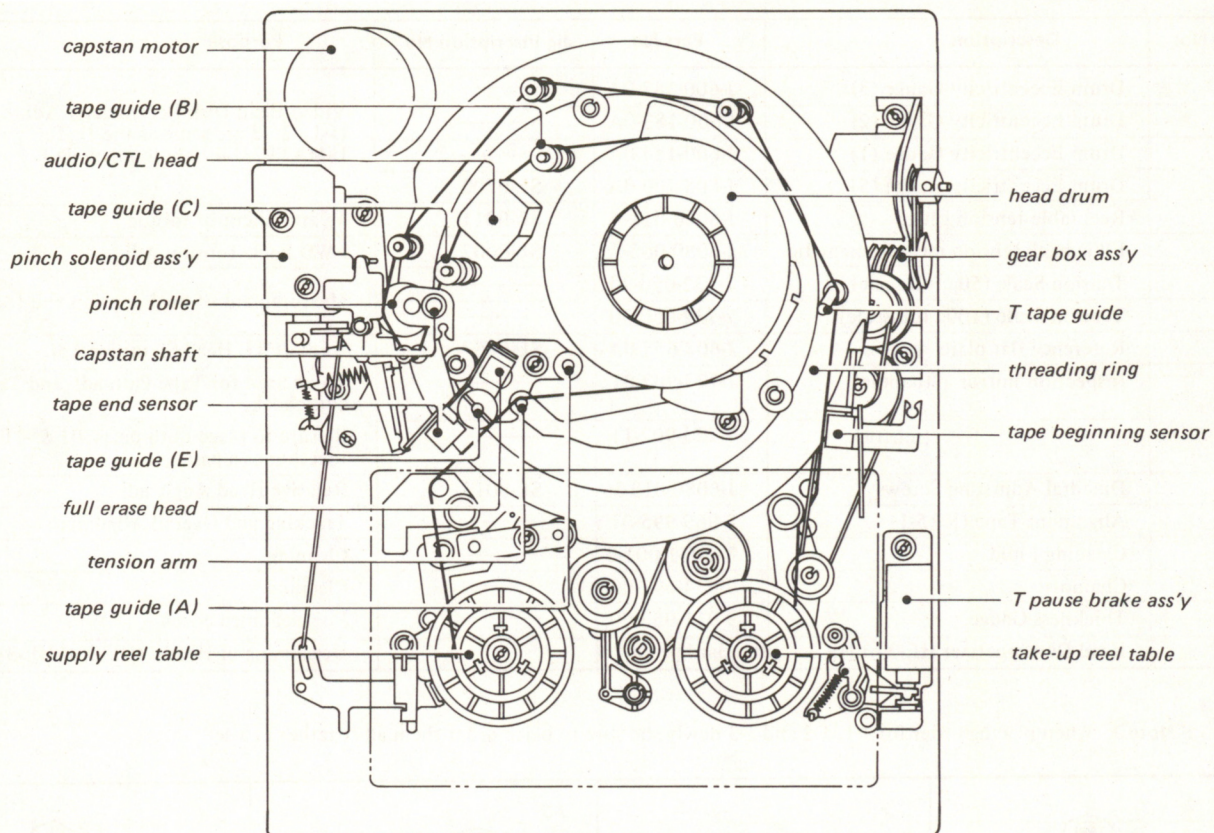


2. By soldering directly without via connector.





## 2-7. LOCATION OF MAIN PARTS

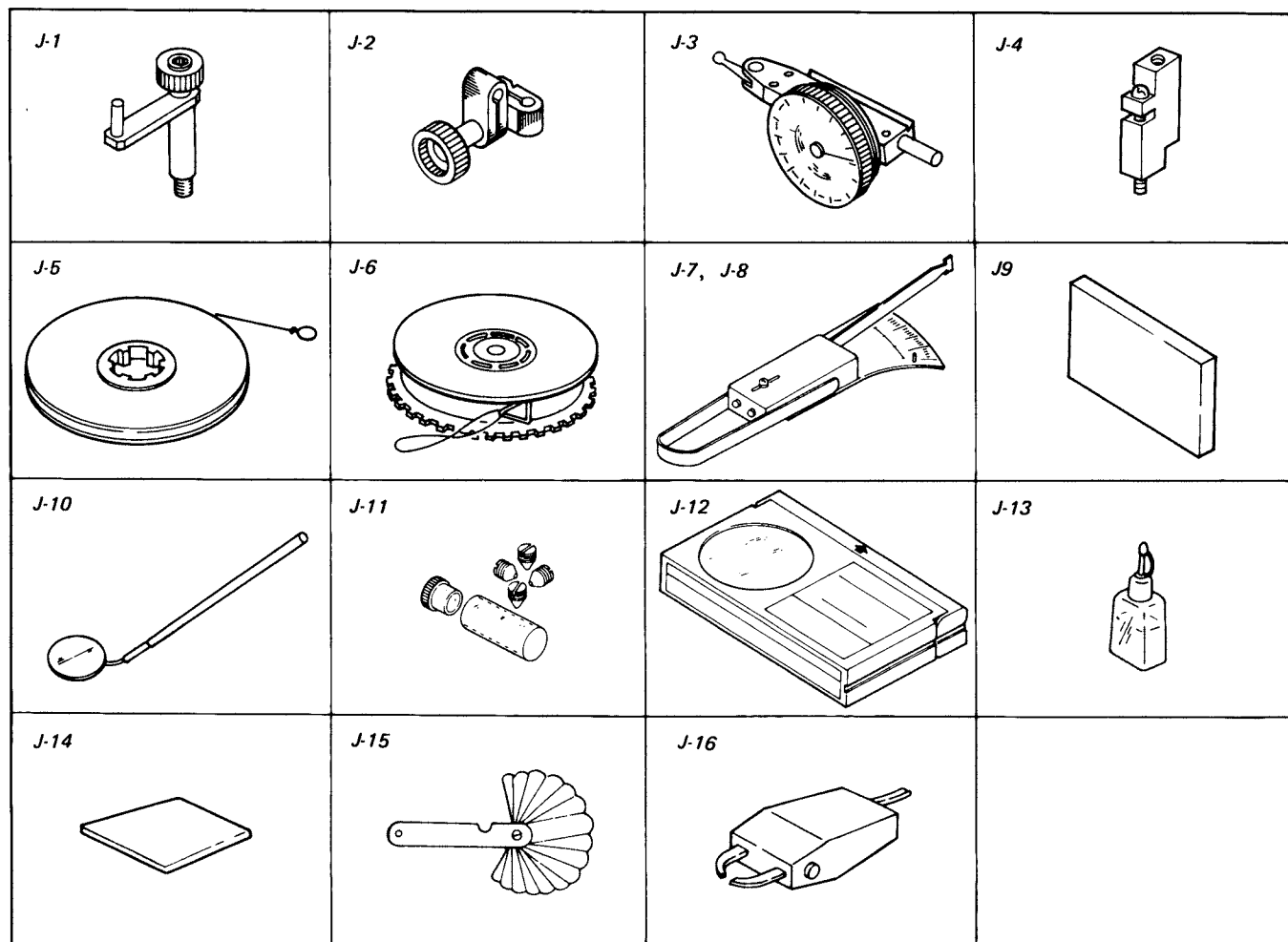




## 2-8. JIGS REQUIRED FOR ALIGNMENT

| Ref. No. | Description                      | Part No.          | Jig inscription No. | Purpose                                                                                                    |
|----------|----------------------------------|-------------------|---------------------|------------------------------------------------------------------------------------------------------------|
| J-1      | Drum Eccentricity Gauge (3)      | J-600-182-0A      | —                   | Video Head Disk Eccentricity Adj.<br>(J-1, -2, -3 are same as the Jig for U-MATIC. J-4 only is a new jig.) |
| J-2      | Drum Eccentricity Gauge (2)      | J-600-183-0A      | —                   |                                                                                                            |
| J-3      | Drum Eccentricity Gauge (1)      | J-600-184-0A      | —                   |                                                                                                            |
| J-4      | Drum Eccentricity Gauge (5)      | J-608-700-0A      | SL-0700             |                                                                                                            |
| J-5      | Reel table tension gauge         | J-6080-011-A      | SL-0011             | Measurement of torque                                                                                      |
| J-6      | FWD back tension measurement Jig | J-6080-002-A      | SL-0002             | FWD Back Tension Adj.                                                                                      |
| J-7      | Tension Scale (50g full scale)   | 7-732-050-20      | —                   | Measurement of back tension and torque                                                                     |
| J-8      | Tension Scale (100g full scale)  | 7-732-050-30      | —                   |                                                                                                            |
| J-9      | Reference flat plate             | J-608-657-0A      | SL-0657             | Audio/CTL Head Slantness Adj.                                                                              |
| J-10     | Inspection mirror (handle)       | 7-723-902-01      | —                   | To be used for Tape Path adj. and Tape Run adj./check.                                                     |
|          | (mirror)                         | 7-723-902-11      | —                   | Be sure to place both parts -01 & -11 all together as a pair.                                              |
| J-11     | Dihedral Adjusting Screws        | J-6080-013-1      | SL-0013             | Relative Head Angle adj.                                                                                   |
| J-12     | Alignment Tape (KR5-1)           | 8-969-995-01      | —                   | Tracking and Overall Alignment                                                                             |
| J-13     | Cleaning Fluid                   | Y-2031-001-0      | —                   | Cleaning                                                                                                   |
| J-14     | Chamois                          | 2-034-697-00      | —                   | Cleaning                                                                                                   |
| J-15     | Thickness Gauge                  | 9-911-053-00      | —                   | For clearance check                                                                                        |
| J-16     | Head Demagnetizer HE-2 or HE-3   | standard products | —                   | Degaussing of Heads. (HE-2 or HE-3)                                                                        |

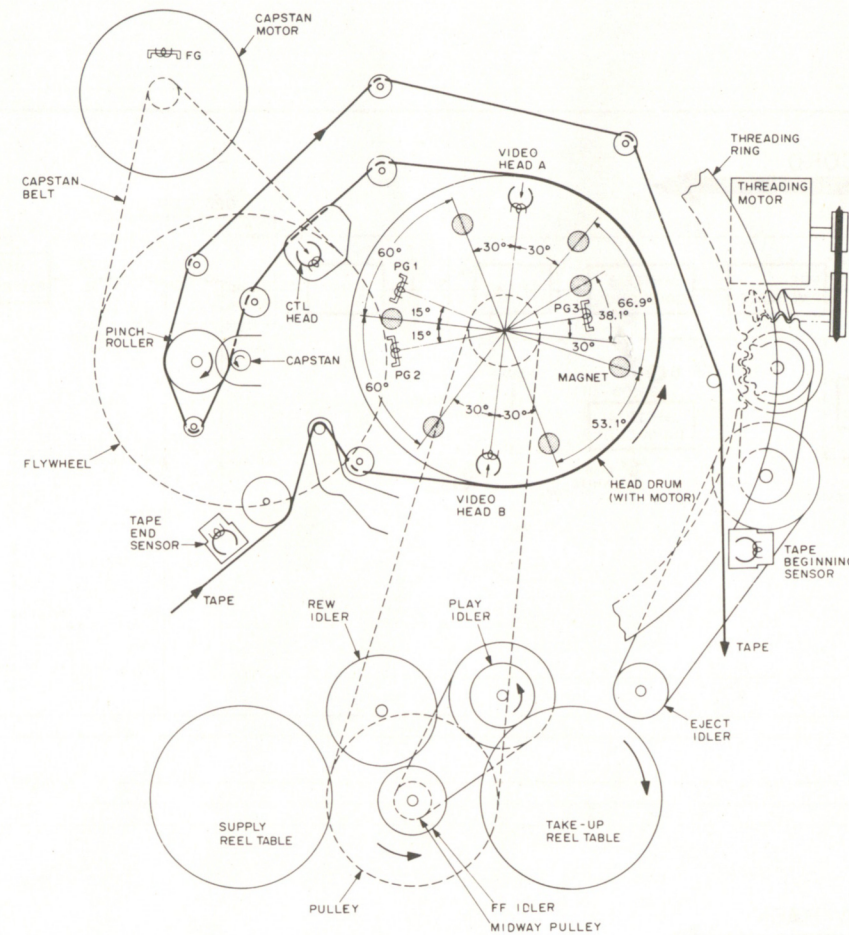
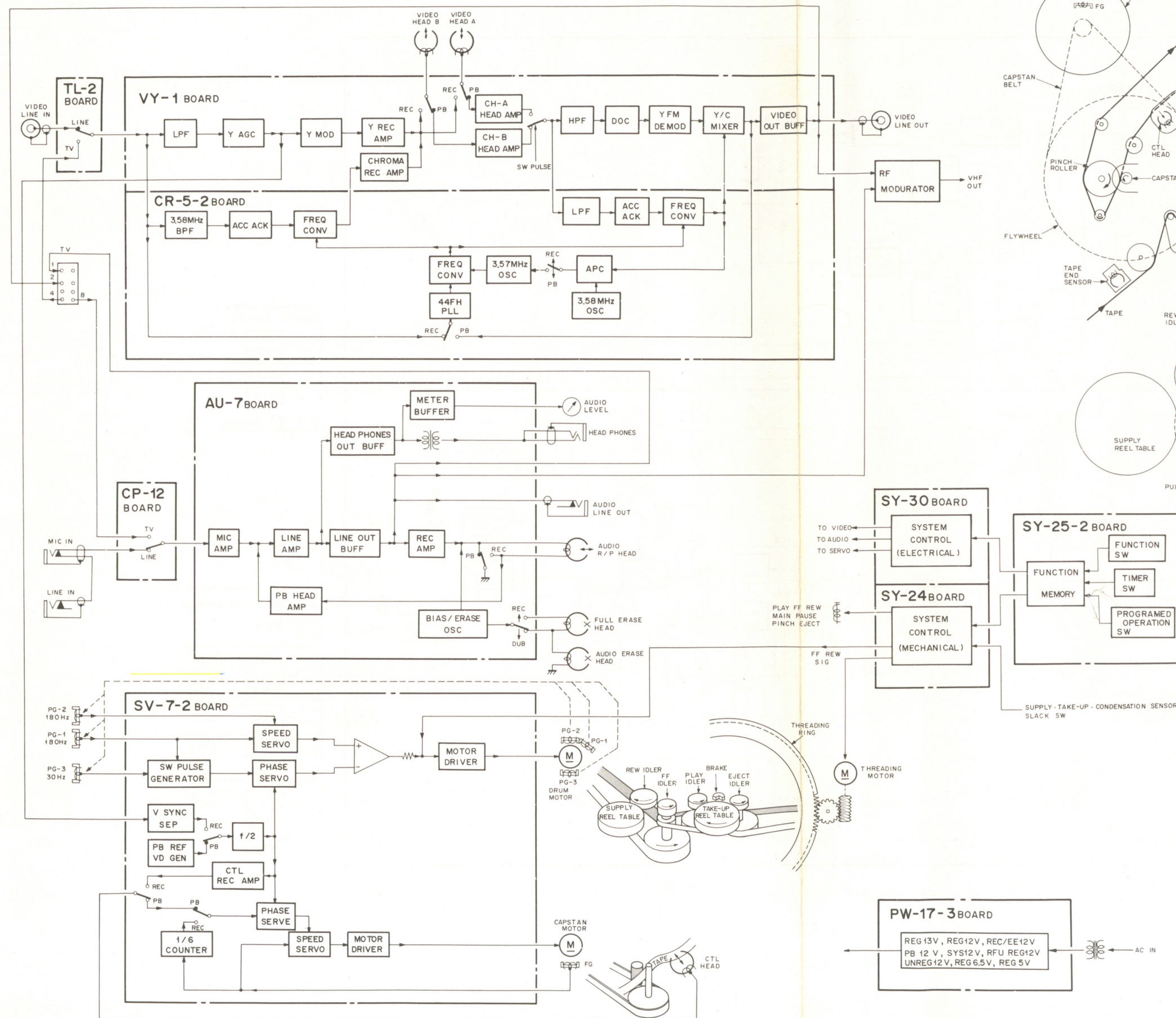
<Note> When placing order for J-1, J-2 and J-3 newly, be sure to place order them all together as a set.





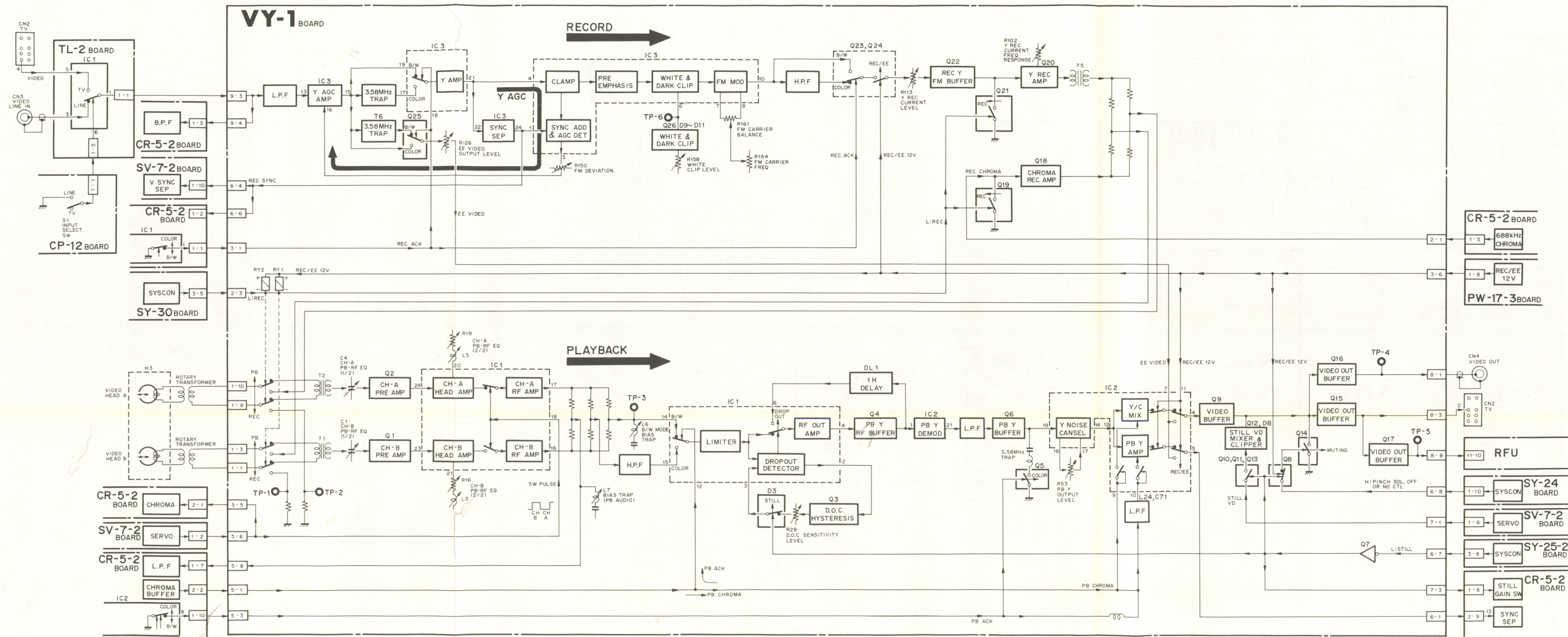
# SECTION 3 DIAGRAMS

OVERALL SYSTEM BLOCK DIAGRAM





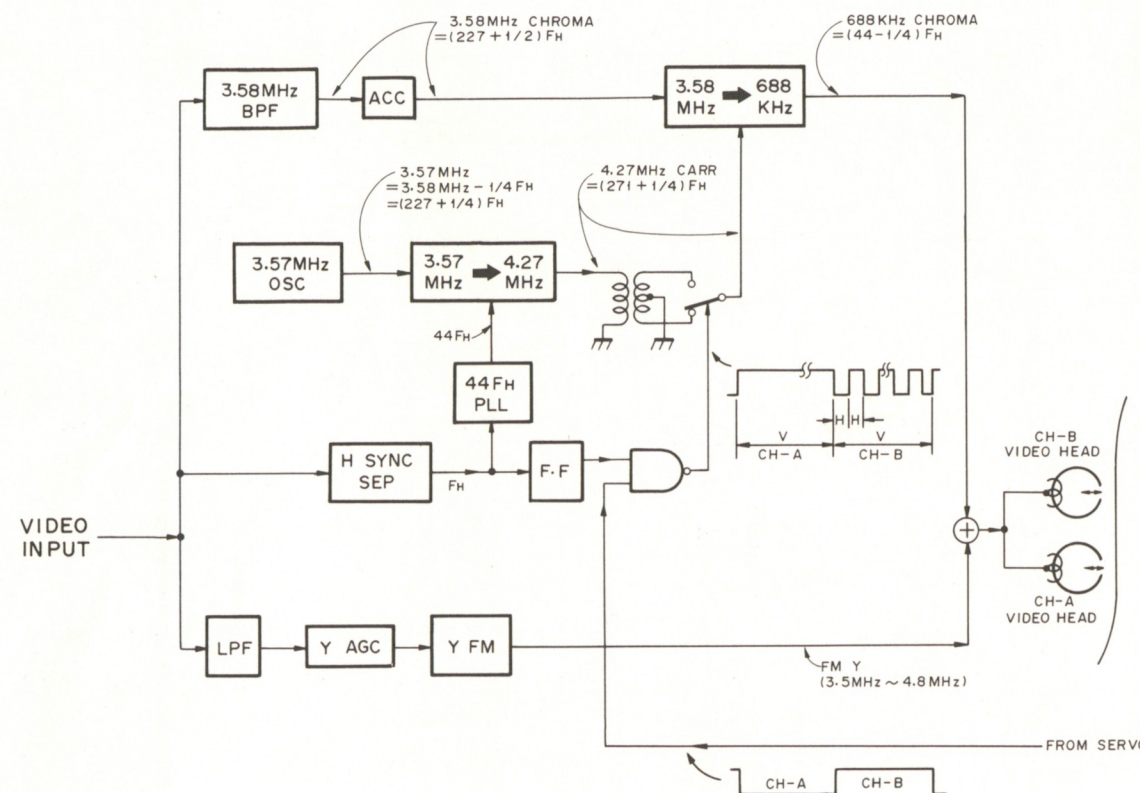
Y SIGNAL BLOCK DIAGRAM





CHROMA FREQ. CONV. BLOCK DIAGRAM

RECORDING SYSTEM



PLAYBACK CHROMA JITTER CORRECTION SYSTEM

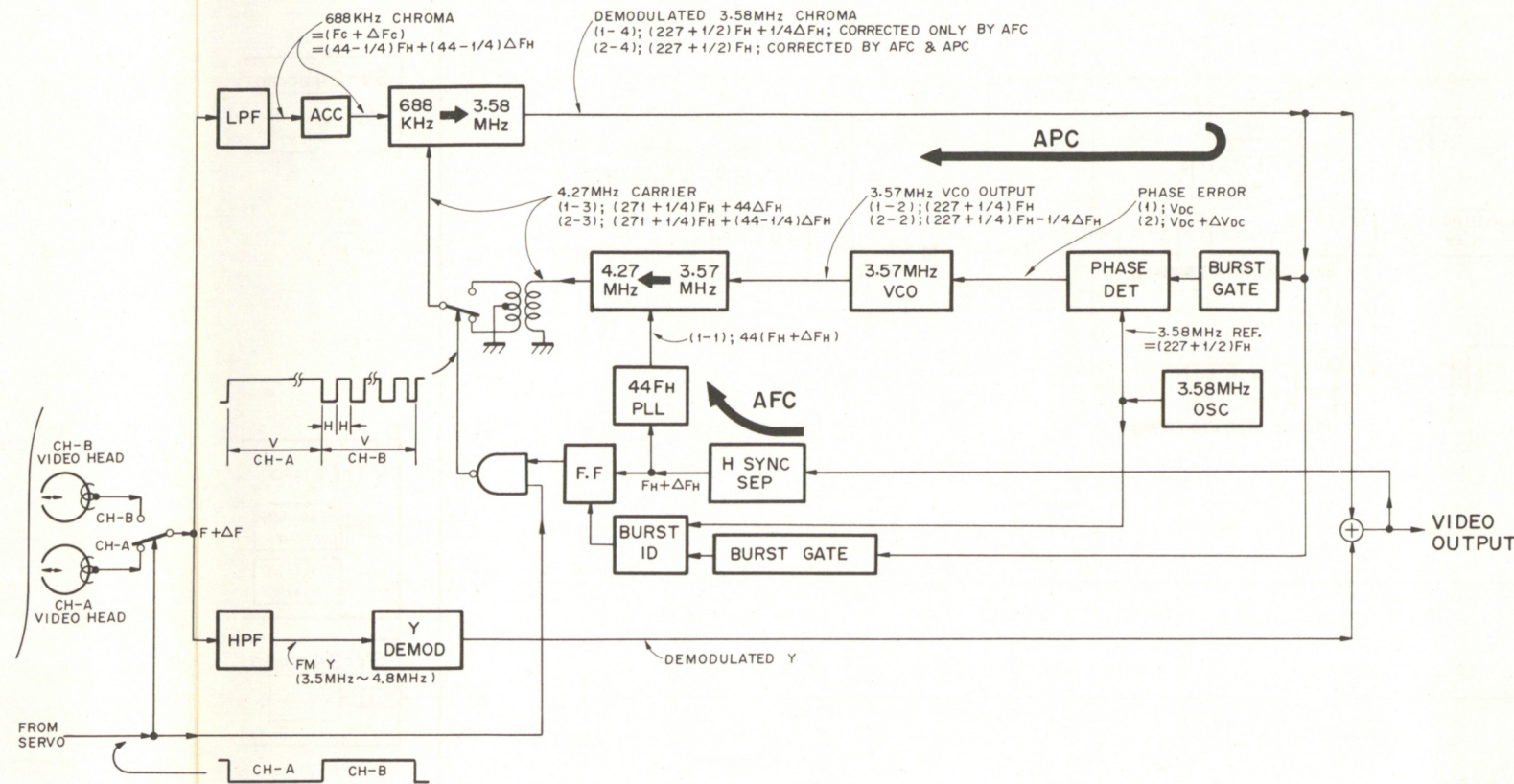
Let's show the all frequencies in the horizontal sync frequency  $F_H$ .

$H_{SYNC} = 15.734 \text{ kHz} = F_H$   
 $\text{Sub-carrier} = 3.579545 \text{ MHz} = (227 + 1/2) F_H$   
 $688 \text{ kHz Chroma} = 688.374 \text{ kHz} = (44 - 1/4) F_H$   
 $4.27 \text{ MHz Carrier} = 4.267919 \text{ MHz} = (271 + 1/4) F_H$   
 $3.57 \text{ MHz} = 3.575611 \text{ MHz} = (227 + 1/4) F_H$   
 $44\text{-Hsync} = 692.308 \text{ kHz} = 44F_H$

$$\frac{\Delta F}{F} = \frac{\Delta F_c}{F_c} = \frac{\Delta F_H}{F_H} ; \Delta F = \text{jitter}$$

$PB \ H_{SYNC} \text{ with jitter} = F_H + \Delta F_H$   
 $PB \ 688 \text{ kHz Chroma with jitter} = F_c + \Delta F_c$   
 $= (44 - 1/4) F_H + (44 - 1/4) \Delta F_H$

PLAYBACK SYSTEM



1. AFC Operation

- 1-1.  $44 F_H \text{ PLL output} = 44 (F_H + \Delta F_H)$
- 1-2. Let's assume the  $3.57 \text{ MHz VCO}$  frequency to be constant  $(227 + 1/4) F_H$ ; i.e. the Phase detector output to be constant.  
 $3.57 \text{ MHz VCO output} = (227 + 1/4) F_H$
- 1-3.  $4.27 \text{ MHz Carrier} = F_{3.57 \text{ MHz VCO}} + 44 F_H \text{ PLL}$   
 $= (227 + 1/4) F_H + 44 (F_H + \Delta F_H)$   
 $= (271 + 1/4) F_H + 44 \Delta F_H$
- 1-4. Demodulated  $3.58 \text{ MHz Chroma}$   
 $= 4.27 \text{ MHz Carrier} - 688 \text{ kHz Chroma}$   
 $= [(271 + 1/4) F_H + 44 \Delta F_H] - [(44 - 1/4) F_H + (44 - 1/4) \Delta F_H]$   
 $= (227 + 1/2) F_H + 1/4 \Delta F_H$

$\therefore$  AFC circuit corrects the jitter  $44 \Delta F_H$  in the total jitter  $(44 - 1/4) \Delta F_H$ .

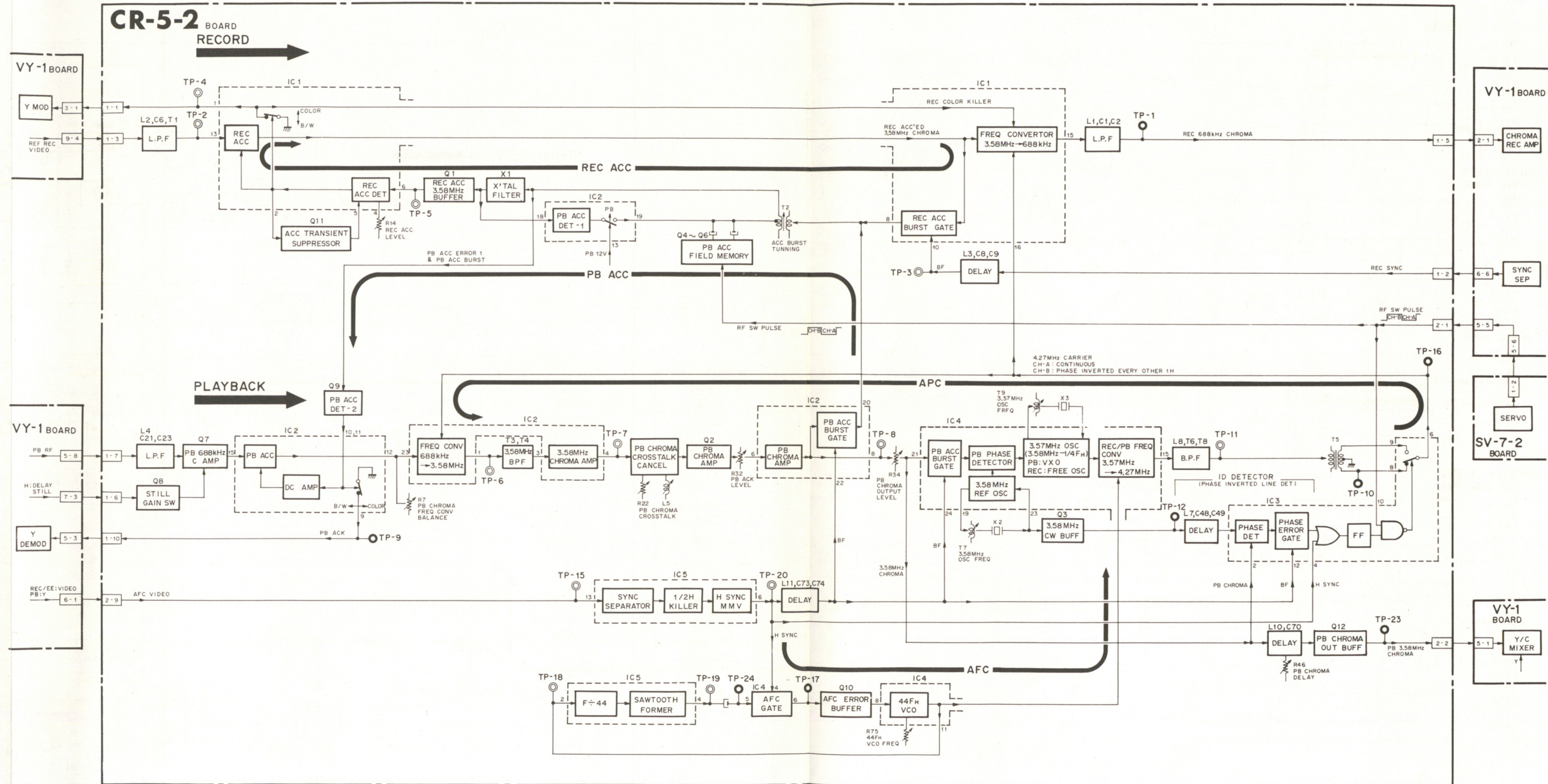
2. APC operation after corrected by AFC

Since the jitter  $44 \Delta F_H$  in the total jitter  $(44 - 1/4) \Delta F_H$  is corrected by the AFC circuit, the APC circuit should correct the remaining jitter  $(-1/4) \Delta F_H$ .

- 2-1. Phase detector output  $= V_{DC} + \Delta V_{DC}$   
 $V_{DC}$ : Phase detector output when the jitter is completely corrected.  
 $V_{DC} + \Delta V_{DC}$ : Phase detector output when the jitter is corrected only by AFC circuit.
- 2-2.  $3.57 \text{ MHz VCO}$  frequency when  $(V_{DC} + \Delta V_{DC})$  is applied  
 $= (227 + 1/4) F_H - 1/4 \Delta F_H$   
 $\text{by } V_{DC} \quad \text{by } \Delta V_{DC}$
- 2-3.  $4.27 \text{ MHz Carrier}$   
 $= F_{3.57 \text{ MHz VCO}} + 44 F_H \text{ PLL}$   
 $= [(227 + 1/4) F_H - 1/4 \Delta F_H] + 44 (F_H + \Delta F_H)$   
 $= (271 + 1/4) F_H + (44 - 1/4) \Delta F_H$
- 2-4. Demodulated  $3.58 \text{ MHz Chroma}$   
 $= 4.27 \text{ MHz Carrier} - 688 \text{ kHz Chroma}$   
 $= [(271 + 1/4) F_H + (44 - 1/4) \Delta F_H] - [(44 - 1/4) F_H + (44 - 1/4) \Delta F_H]$   
 $= (227 + 1/2) F_H$

$\therefore$  The total jitter  $(44 - 1/4) \Delta F_H$  in the PB  $688 \text{ kHz Chroma}$  signal is corrected by the AFC & APC circuits.

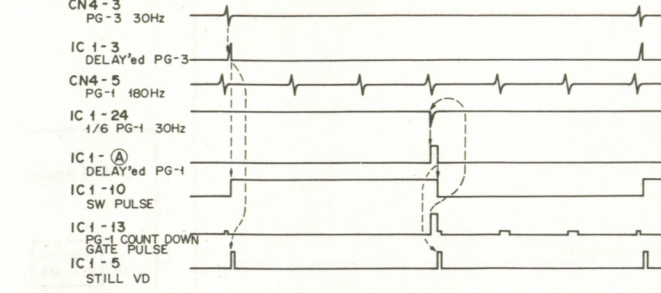
CHROMA SIGNAL BLOCK DIAGRAM



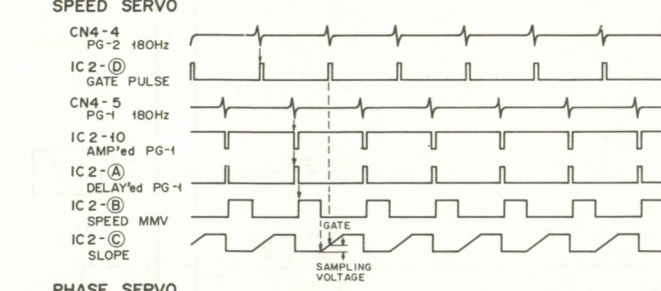


SERVO SYSTEM TIMING CHART

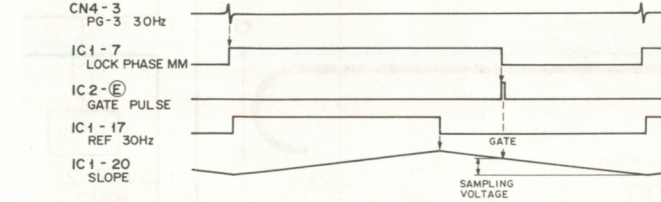
PG-1 COUNT DOWN & PULSE GENERATOR



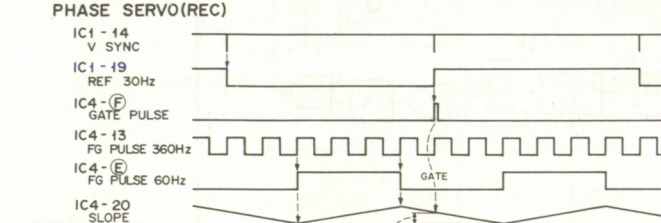
DRUM SERVO



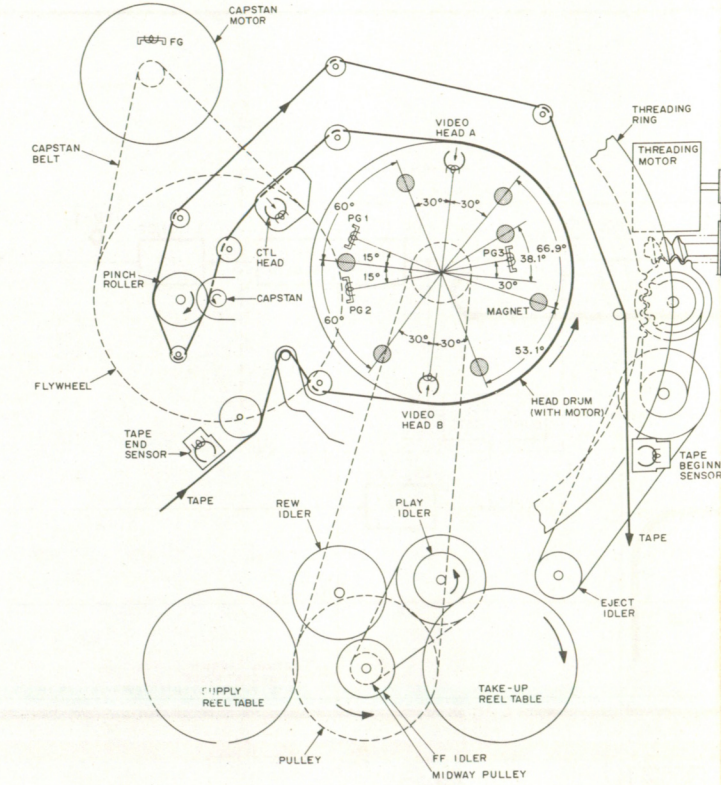
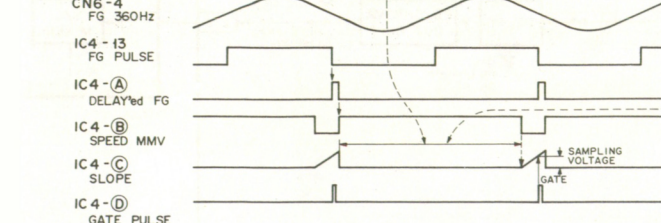
PHASE SERVO



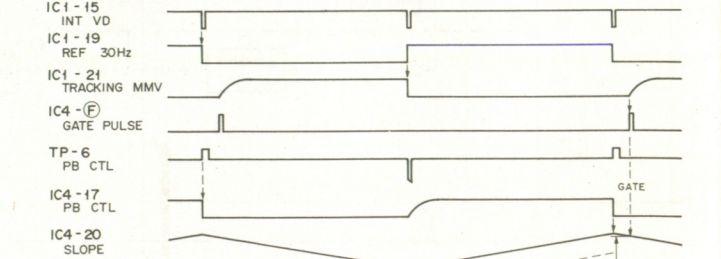
CAPSTAN SERVO



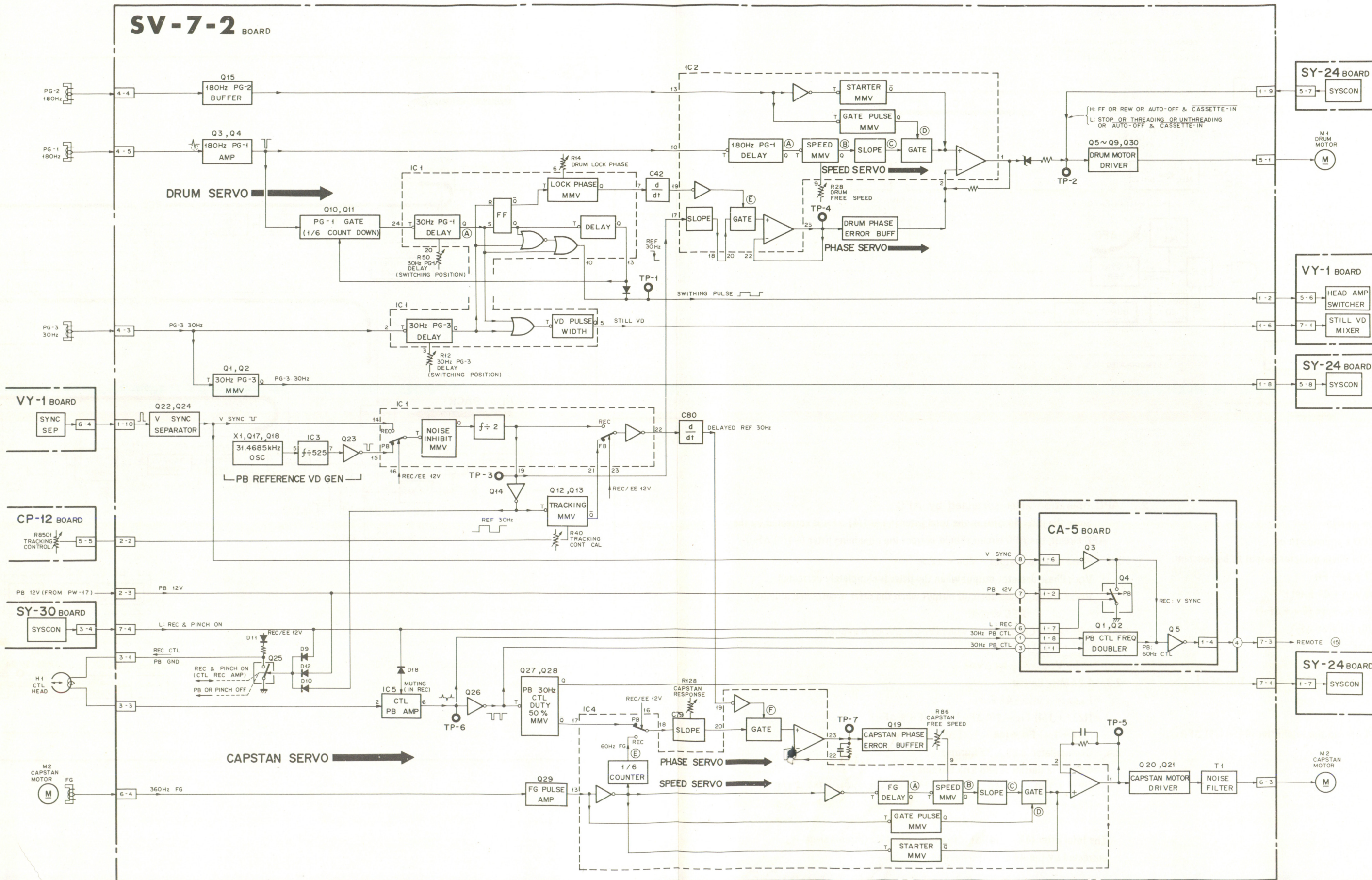
SPEED SERVO



PHASE SERVO(PB)

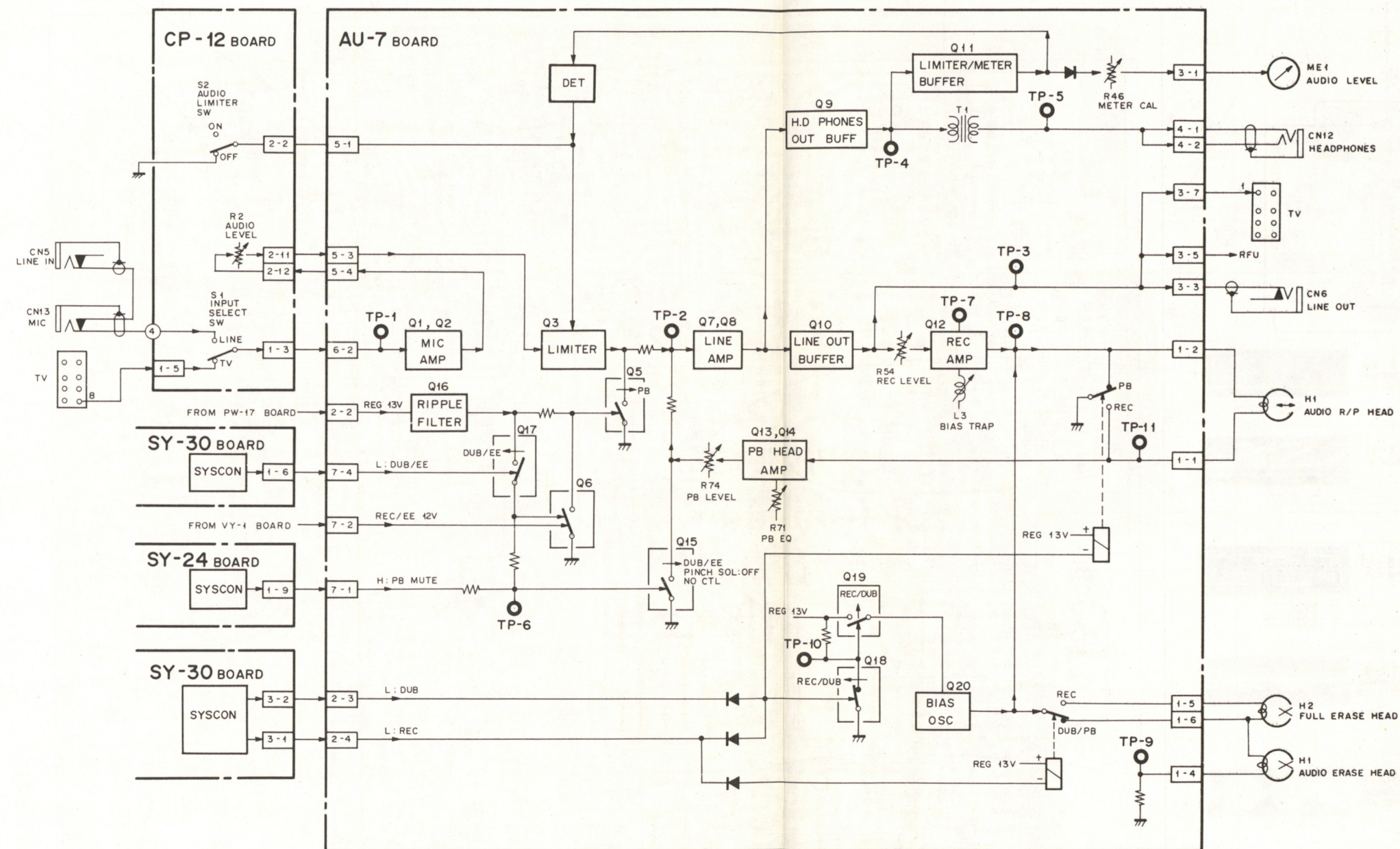


SERVO SYSTEM BLOCK DIAGRAM





AUDIO BLOCK DIAGRAM

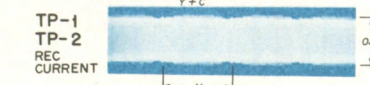
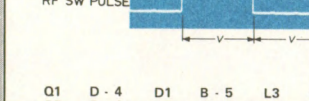
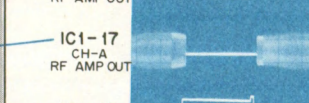
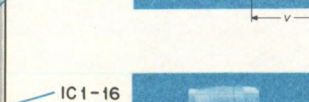
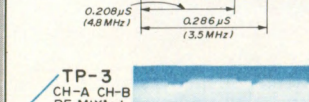
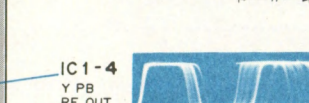
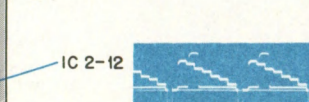
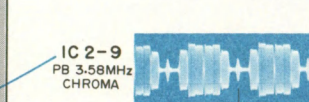
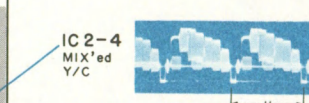
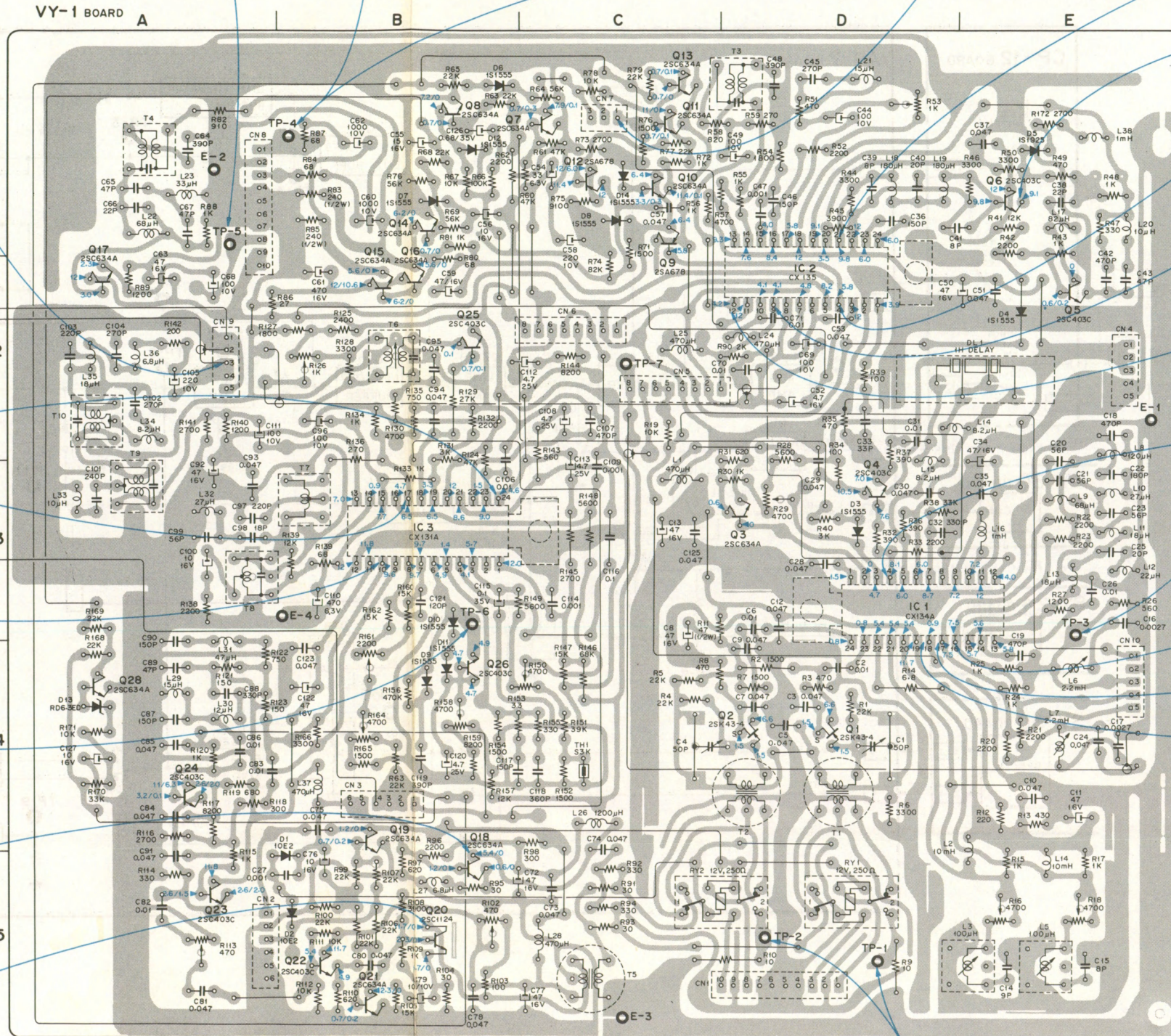
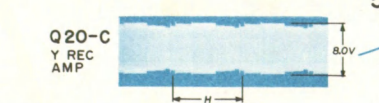
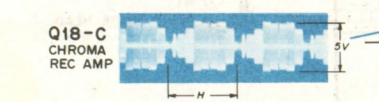
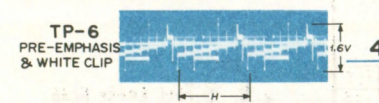
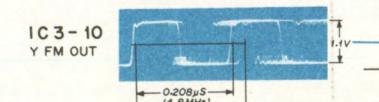
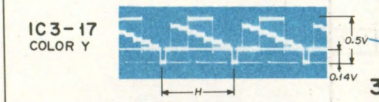
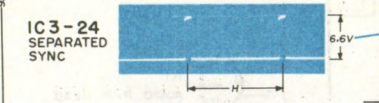
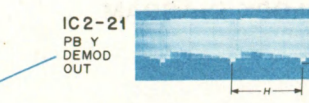
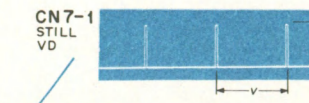
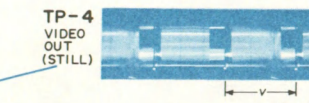
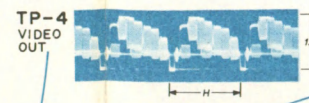
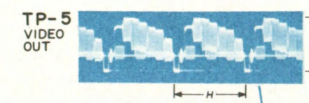
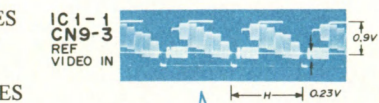
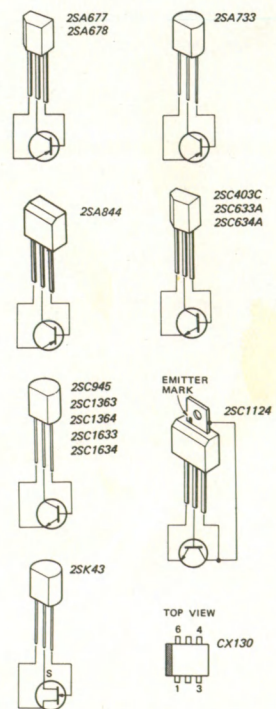
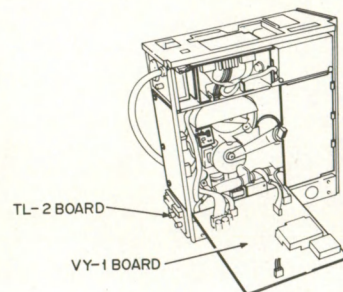
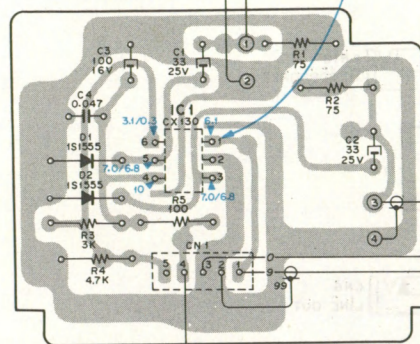




TL-2 BOARD REF. NO. 9050 SERIES  
VIDEO INPUT SELECTOR

VY-1 BOARD REF. NO. 1000 SERIES  
Y MODULATOR/DEMODULATOR  
Y/C REC/PB AMPLIFIER  
- SOLDERING SIDE -

TL-2 BOARD



NOTE:

- ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20kΩ/V), IN CONDITIONS BELOW, UNLESS OTHERWISE SPECIFIED.  
RECORD PROCESS : RECORD MODE  
PLAYBACK PROCESS : PLAYBACK MODE
- ALL WAVEFORMS ARE TAKEN IN CONDITIONS BELOW.  
RECORD MODE : VIDEO INPUT 75% COLOR-BAR 1Vp-p  
PLAYBACK MODE : COLOR-BAR ALIGNMENT TAPE

|     |     |      |     |      |     |
|-----|-----|------|-----|------|-----|
| Q1  | D-4 | D1   | B-5 | L3   | E-5 |
| Q2  | D-4 | D2   | B-5 | L5   | E-5 |
| Q3  | D-3 | D3   | D-3 | L6   | E-4 |
| Q4  | D-3 | D4   | E-2 | L7   | E-4 |
| Q5  | E-2 | D5   | E-1 |      |     |
| Q6  | E-1 | D6   | B-1 | T6   | B-2 |
| Q7  | C-1 | D7   | B-1 |      |     |
| Q8  | B-1 | D8   | C-1 | CN1  | D-5 |
| Q9  | C-1 | D9   | B-4 | CN2  | A-5 |
| Q10 | C-1 | D10  | B-3 | CN3  | B-4 |
| Q11 | C-1 | D11  | B-4 | CN4  | E-2 |
| Q12 | C-1 | D12  | B-1 | CN5  | C-2 |
| Q13 | C-1 | D13  | A-4 | CN6  | C-2 |
| Q14 | B-1 | D14  | C-1 | CN7  | C-1 |
| Q15 | B-2 |      |     | CN8  | A-1 |
| Q16 | B-2 | DL1  | E-2 | CN9  | A-2 |
| Q17 | A-2 |      |     |      |     |
| Q18 | B-5 | R16  | E-5 | TP-1 | D-5 |
| Q19 | B-4 | R18  | E-5 | TP-2 | D-5 |
| Q20 | B-5 | R29  | D-3 | TP-3 | E-3 |
| Q21 | B-5 | R53  | D-1 | TP-4 | B-1 |
| Q22 | B-5 | R102 | B-5 | TP-5 | A-1 |
| Q23 | A-5 | R113 | A-5 | TP-6 | B-3 |
| Q24 | A-4 | R126 | B-2 | TP-7 | C-2 |
| Q25 | B-2 | R150 | B-4 |      |     |
| Q26 | B-4 | R158 | B-4 | E1   | E-2 |
| Q28 | A-4 | R161 | B-4 | E2   | A-1 |
|     |     | R164 | B-4 | E3   | C-5 |
|     |     |      |     | E4   | B-3 |
| IC1 | D-3 |      |     |      |     |
| IC2 | D-2 | C1   | D-4 |      |     |
| IC3 | B-3 | C4   | C-4 |      |     |

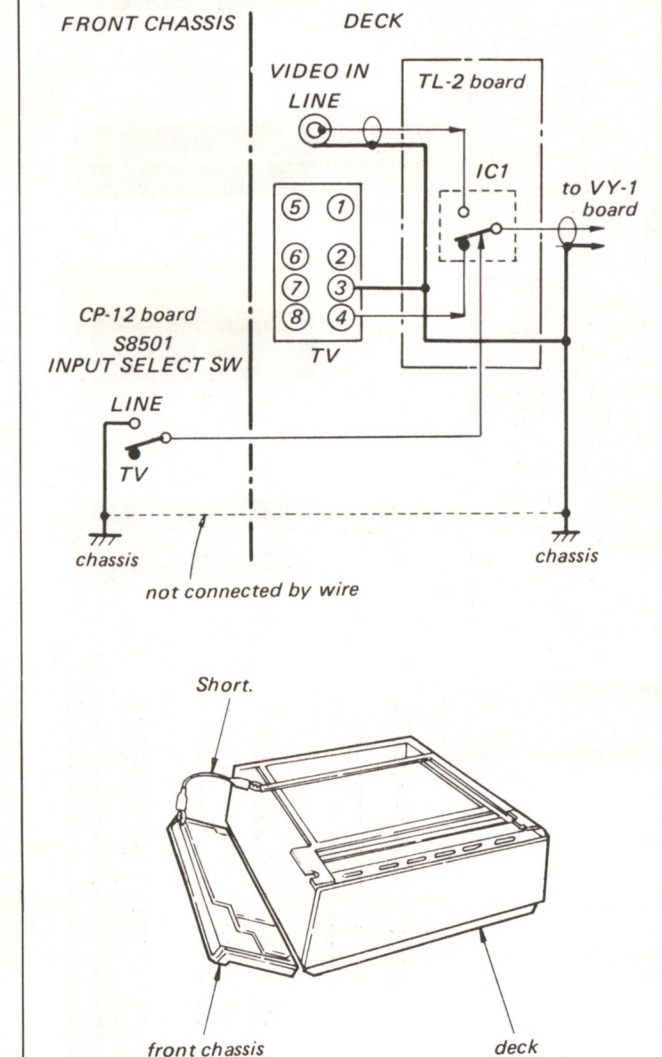


TL-2 BOARD  
VIDEO INPUT SELECTOR

VY-1 BOARD  
Y MODULATOR/DEMODULATOR  
Y/C REC/PB AMPLIFIER

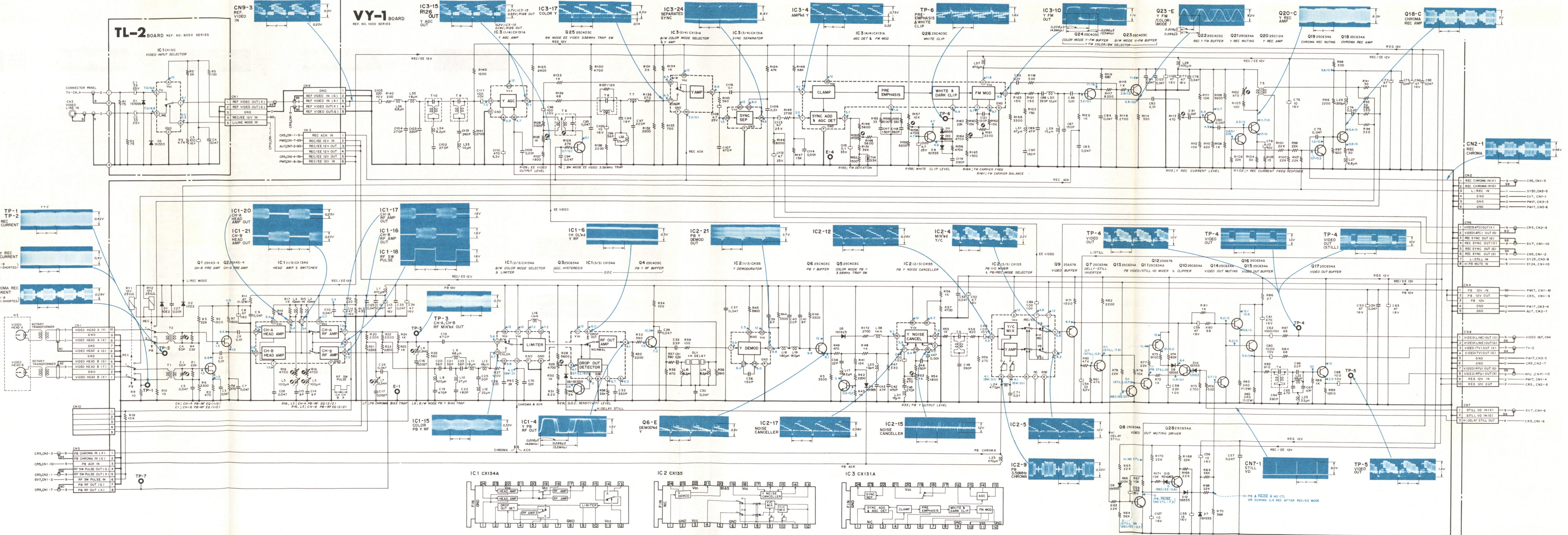
DISASSEMBLY OF FRONT CHASSIS  
(FAULTY OPERATION OF VIDEO INPUT  
SELECTOR)

When disassembling the front chassis should be removed from the machine as in repair work, the TV video input signal that is fed from 8-pin square connector is selected regardless of the INPUT SELECT switch's position. If the video line input signal that is fed from BNC connector is necessary, short between the front panel's chassis and the deck's chassis.



NOTE:

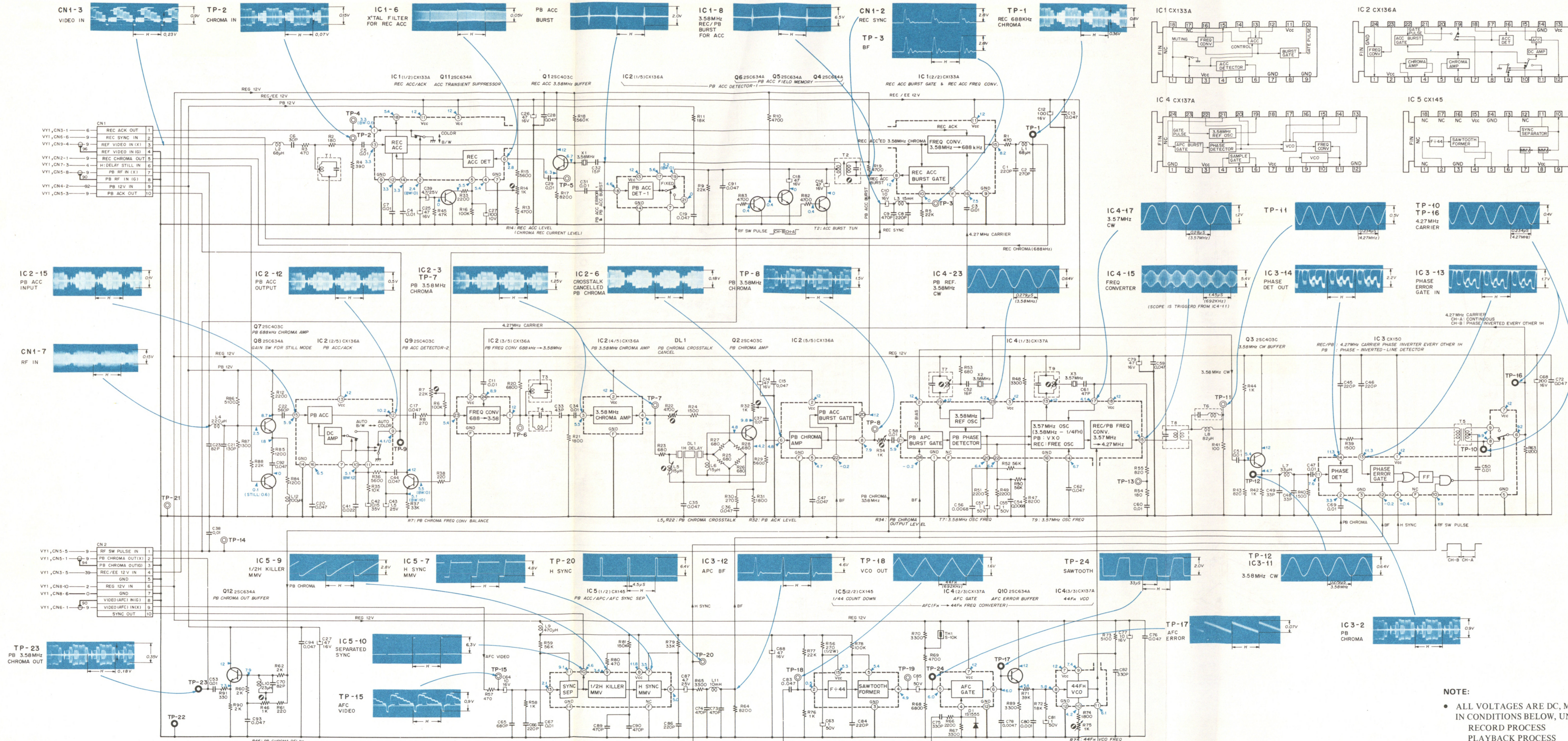
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RECORD PROCESS : RECORD MODE  
PLAYBACK PROCESS : PLAYBACK MODE
- ALL WAVEFORMS ARE TAKEN IN CONDITIONS BELOW.  
RECORD MODE : VIDEO INPUT 75% COLOR-BAR 1Vp-p  
PLAYBACK MODE : COLOR-BAR ALIGNMENT TAPE





**NOTE:**



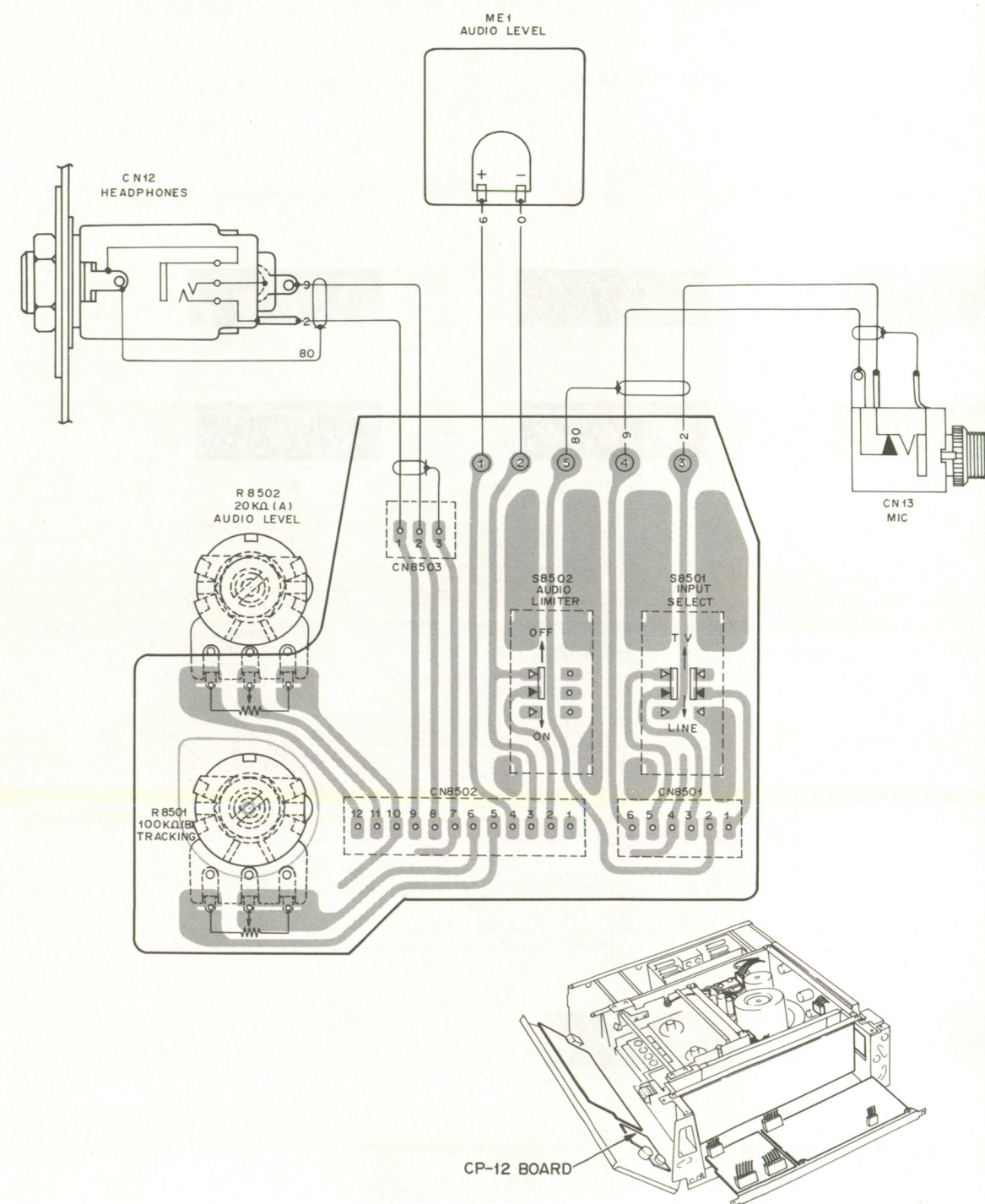


NOTE:

- ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20kΩ/V), IN CONDITIONS BELOW, UNLESS OTHERWISE SPECIFIED.
- RECORD PROCESS : RECORD MODE
- PLAYBACK PROCESS : PLAYBACK MODE
- ALL WAVEFORMS ARE TAKEN IN CONDITIONS BELOW.
- RECORD MODE : VIDEO INPUT 75% COLOR-BAR 1Vp-p
- PLAYBACK MODE : COLOR-BAR ALIGNMENT TAPE



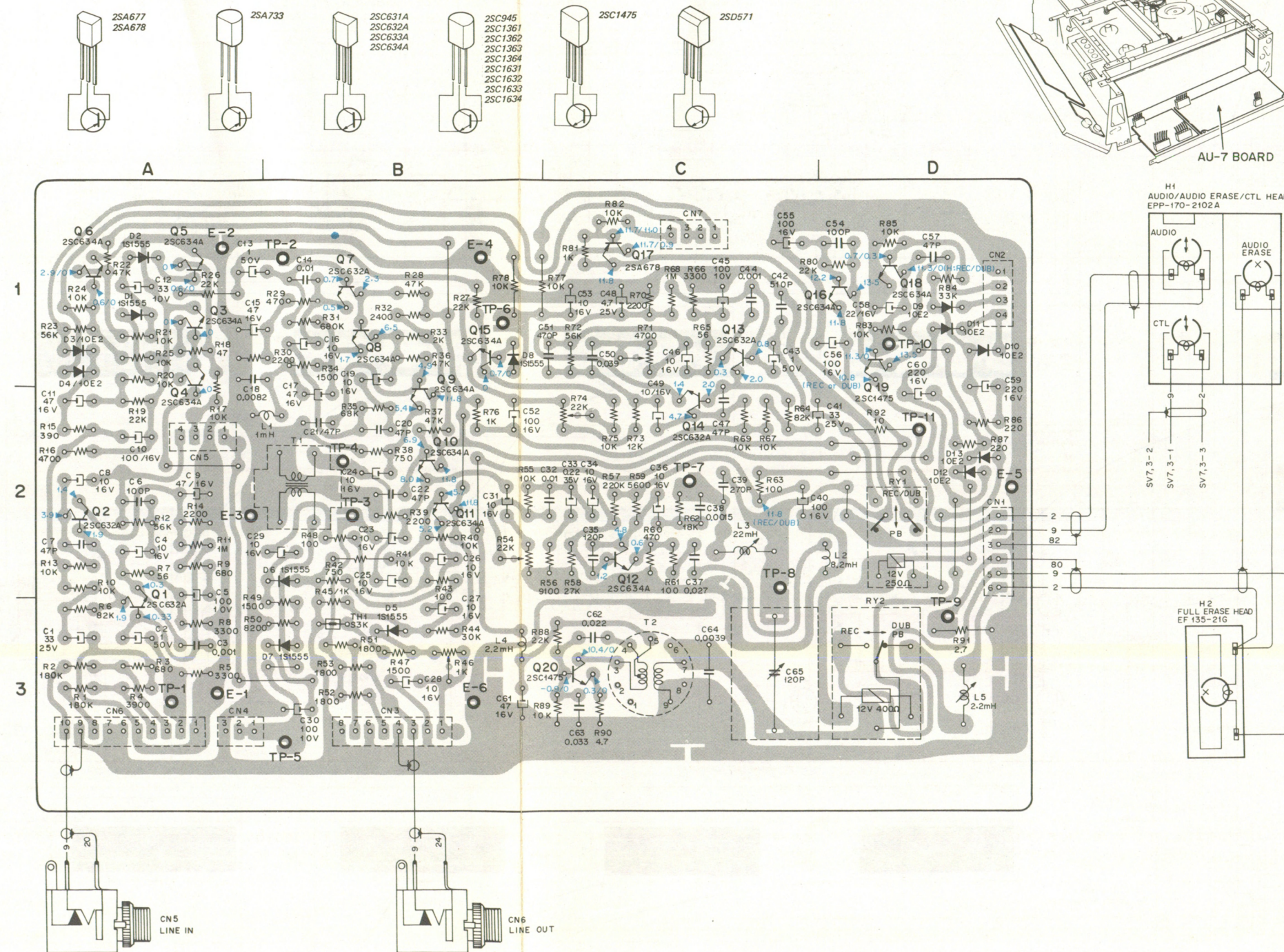
## CP-12 BOARD REF. NO. 8500 SERIES

CONTROL PANEL  
- SOLDERING SIDE -

## AU-7 BOARD REF. NO. 2000 SERIES

AUDIO REC/PB AMPLIFIER  
- SOLDERING SIDE -

|     |       |       |       |
|-----|-------|-------|-------|
| Q1  | A - 3 | R46   | B - 3 |
| Q2  | A - 2 | R54   | B - 2 |
| Q3  | A - 1 | R71   | C - 1 |
| Q4  | A - 1 | R74   | C - 2 |
| Q5  | A - 1 |       |       |
| Q6  | A - 1 | L3    | C - 2 |
| Q7  | B - 1 | L5    | D - 3 |
| Q8  | B - 1 |       |       |
| Q9  | B - 2 | C65   | C - 3 |
| Q10 | B - 2 |       |       |
| Q11 | B - 2 | CN1   | D - 2 |
| Q12 | C - 2 | CN2   | D - 1 |
| Q13 | C - 1 | CN3   | B - 3 |
| Q14 | C - 2 | CN4   | A - 3 |
| Q15 | B - 1 | CN5   | A - 2 |
| Q16 | D - 1 | CN6   | A - 3 |
| Q17 | C - 1 | CN7   | C - 1 |
| Q18 | D - 1 |       |       |
| Q19 | D - 1 |       |       |
| Q20 | C - 3 |       |       |
|     |       | TP-1  | A - 3 |
|     |       | TP-2  | B - 1 |
|     |       | TP-3  | B - 2 |
|     |       | TP-4  | B - 2 |
|     |       | TP-5  | B - 3 |
|     |       | TP-6  | B - 1 |
|     |       | TP-7  | C - 2 |
|     |       | TP-8  | C - 2 |
|     |       | TP-9  | D - 3 |
|     |       | TP-10 | D - 1 |
|     |       | TP-11 | D - 2 |
|     |       |       |       |
|     |       | E1    | A - 3 |
|     |       | E2    | A - 1 |
|     |       | E3    | A - 2 |
|     |       | E4    | B - 1 |
|     |       | E5    | D - 2 |
|     |       | E6    | B - 3 |

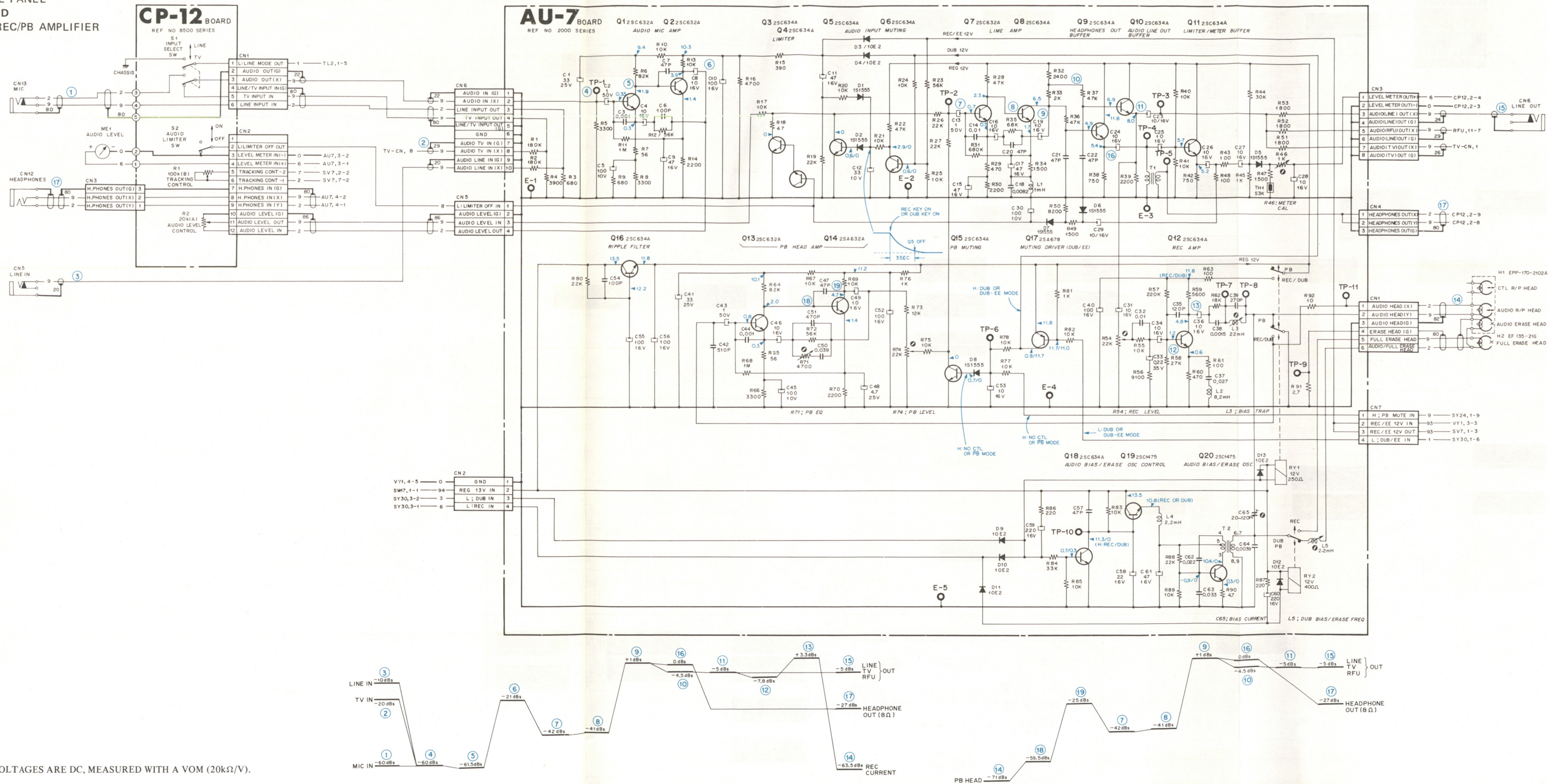


NOTE:

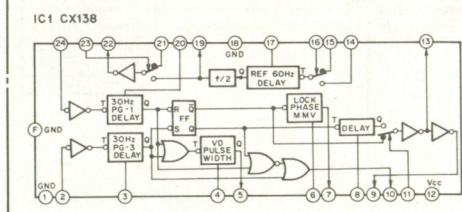
ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20kΩ/V).



CP-12 BOARD  
CONTROL PANEL  
AU-7 BOARD  
AUDIO REC/PB AMPLIFIER





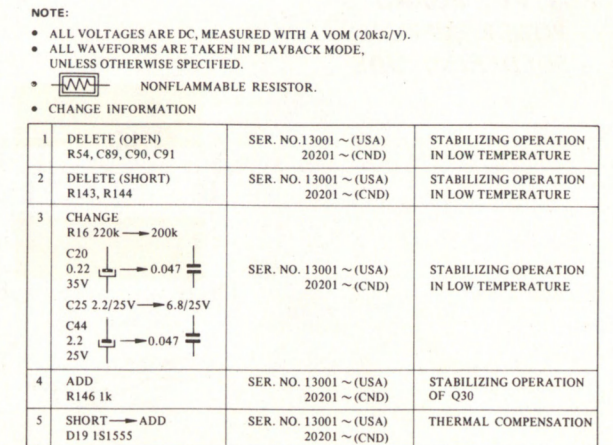


|                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                        |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------|
| NOTE:                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |                                        |                                             |
| <ul style="list-style-type: none"> <li>ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20k<math>\Omega</math>/V).</li> <li>ALL WAVEFORMS ARE TAKEN IN PLAYBACK MODE, UNLESS OTHERWISE SPECIFIED.</li> <li> NON-FLAMMABLE RESISTOR.</li> <li>CHANGE INFORMATION</li> </ul> |                                                                                                                                                                                            |                                        |                                             |
| 1                                                                                                                                                                                                                                                                                                                                                        | DELETE (OPEN)<br>R54, C89, C90, C91                                                                                                                                                        | SER. NO.13001 ~ (USA)<br>20201 ~ (CND) | STABILIZING OPERATION<br>IN LOW TEMPERATURE |
| 2                                                                                                                                                                                                                                                                                                                                                        | DELETE (SHORT)<br>R143, R144                                                                                                                                                               | SER. NO.13001 ~ (USA)<br>20201 ~ (CND) | STABILIZING OPERATION<br>IN LOW TEMPERATURE |
| 3                                                                                                                                                                                                                                                                                                                                                        | CHANGE<br>R16 220k $\rightarrow$ 200k<br>C20<br>0.22 $\mu$ F $\rightarrow$ 0.047 $\mu$ F<br>35V<br>2.2V/25V $\rightarrow$ 6.8/25V<br>C44<br>2.2 $\mu$ F $\rightarrow$ 0.047 $\mu$ F<br>25V | SER. NO.13001 ~ (USA)<br>20201 ~ (CND) | STABILIZING OPERATION<br>IN LOW TEMPERATURE |
| 4                                                                                                                                                                                                                                                                                                                                                        | ADD<br>R146 1k                                                                                                                                                                             | SER. NO.13001 ~ (USA)<br>20201 ~ (CND) | STABILIZING OPERATION<br>OF Q30             |
| 5                                                                                                                                                                                                                                                                                                                                                        | SHORT $\rightarrow$ ADD<br>D19 1S1555                                                                                                                                                      | SER. NO.13001 ~ (USA)<br>20201 ~ (CND) | THERMAL COMPENSATION                        |



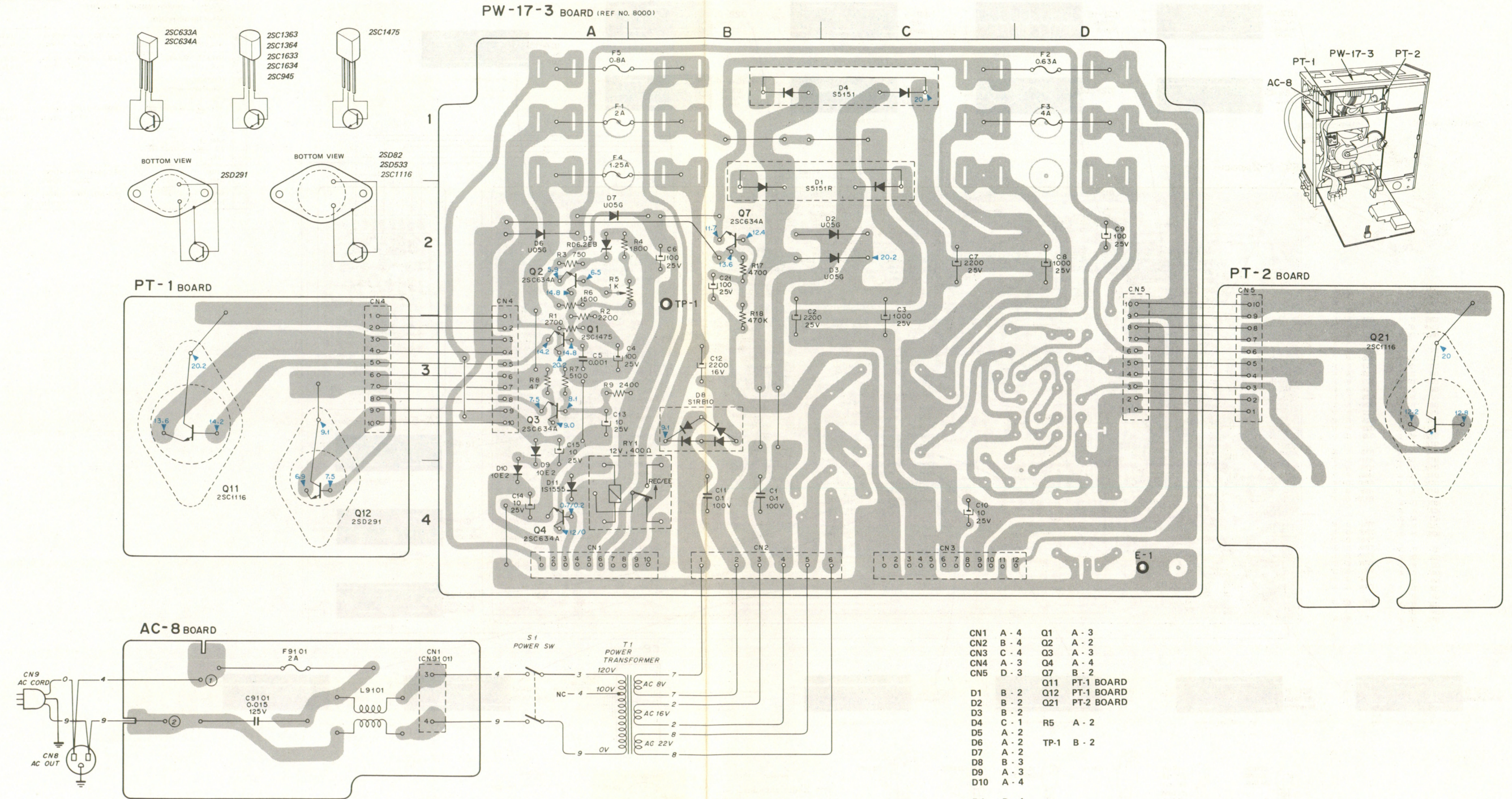
## SV-7-2, CA-5

Diagram illustrating the assembly components for the SV-7-2 board, showing the CAPSTAN MOTOR, SV-7-2 BOARD, and CA-5 BOARD.





AC-8, PW-17-3  
PT-1, PT-2 BOARD  
POWER SUPPLY  
- SOLDERING SIDE -

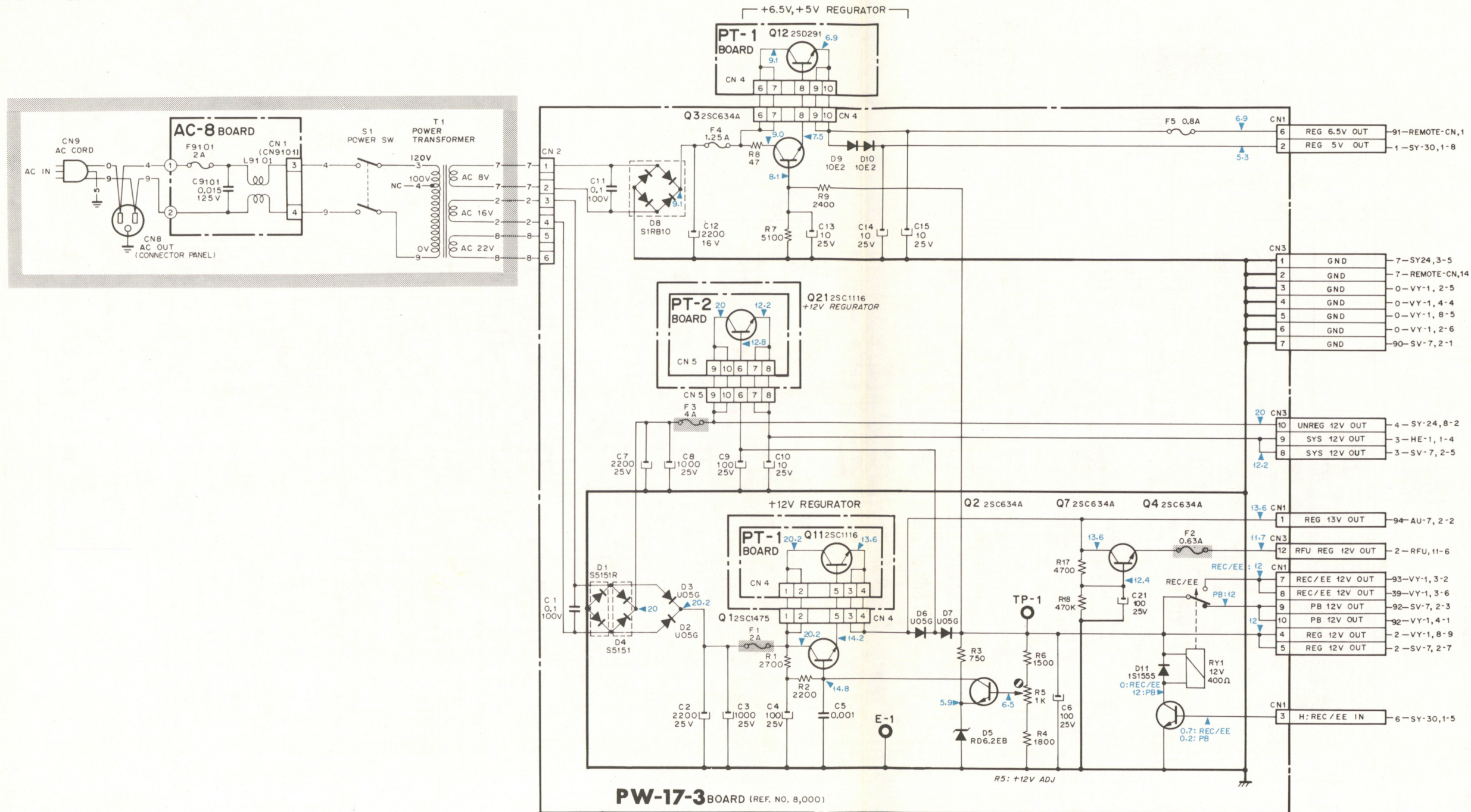


NOTE:

ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20kΩ/V).



AC-8 PW-17-3  
PT-1, PT-2 BOARD  
POWER SUPPLY



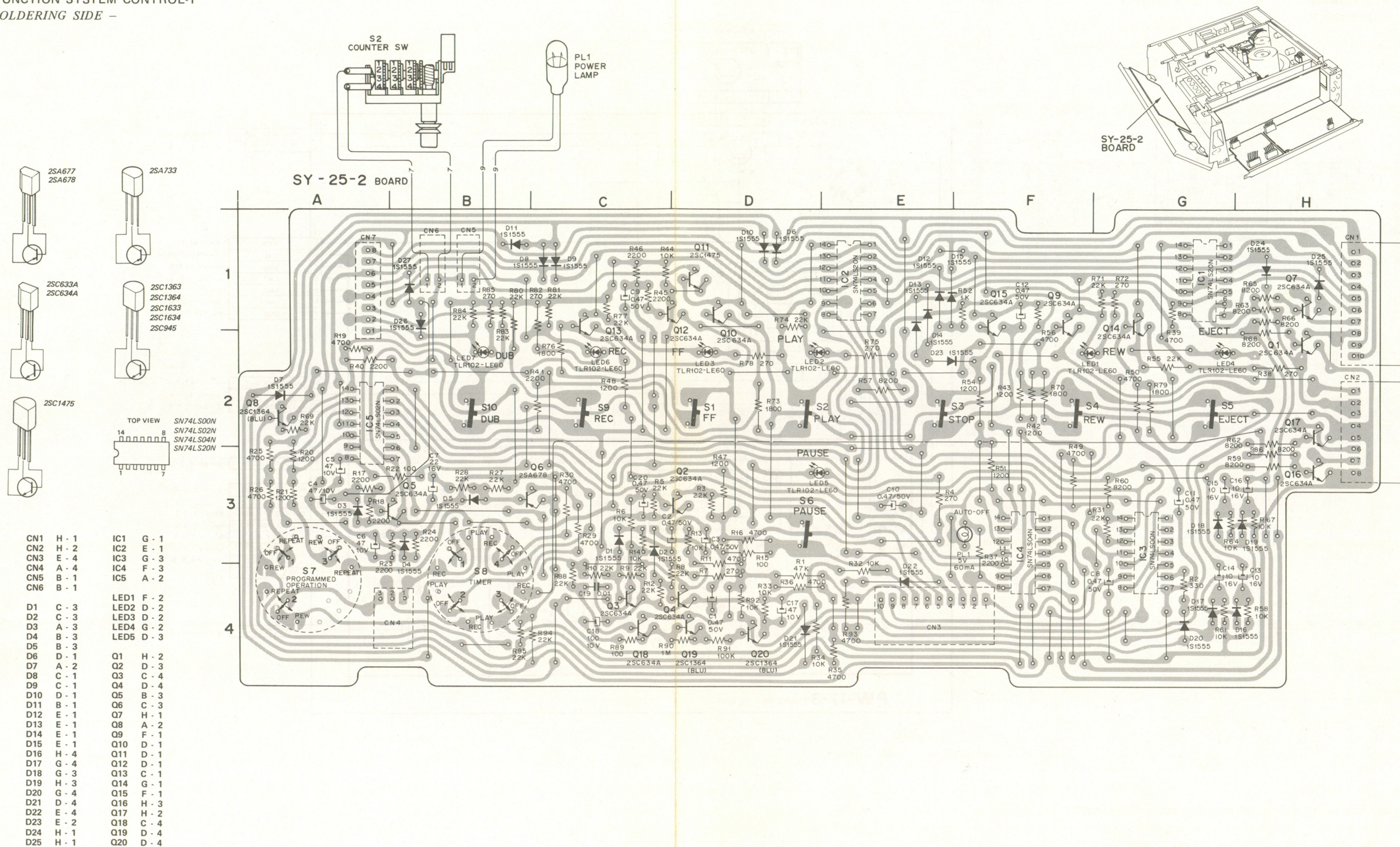
## NOTE:

ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20k $\Omega$ /V).

The shaded components are critical to safety.  
Replace only with same component as specified.

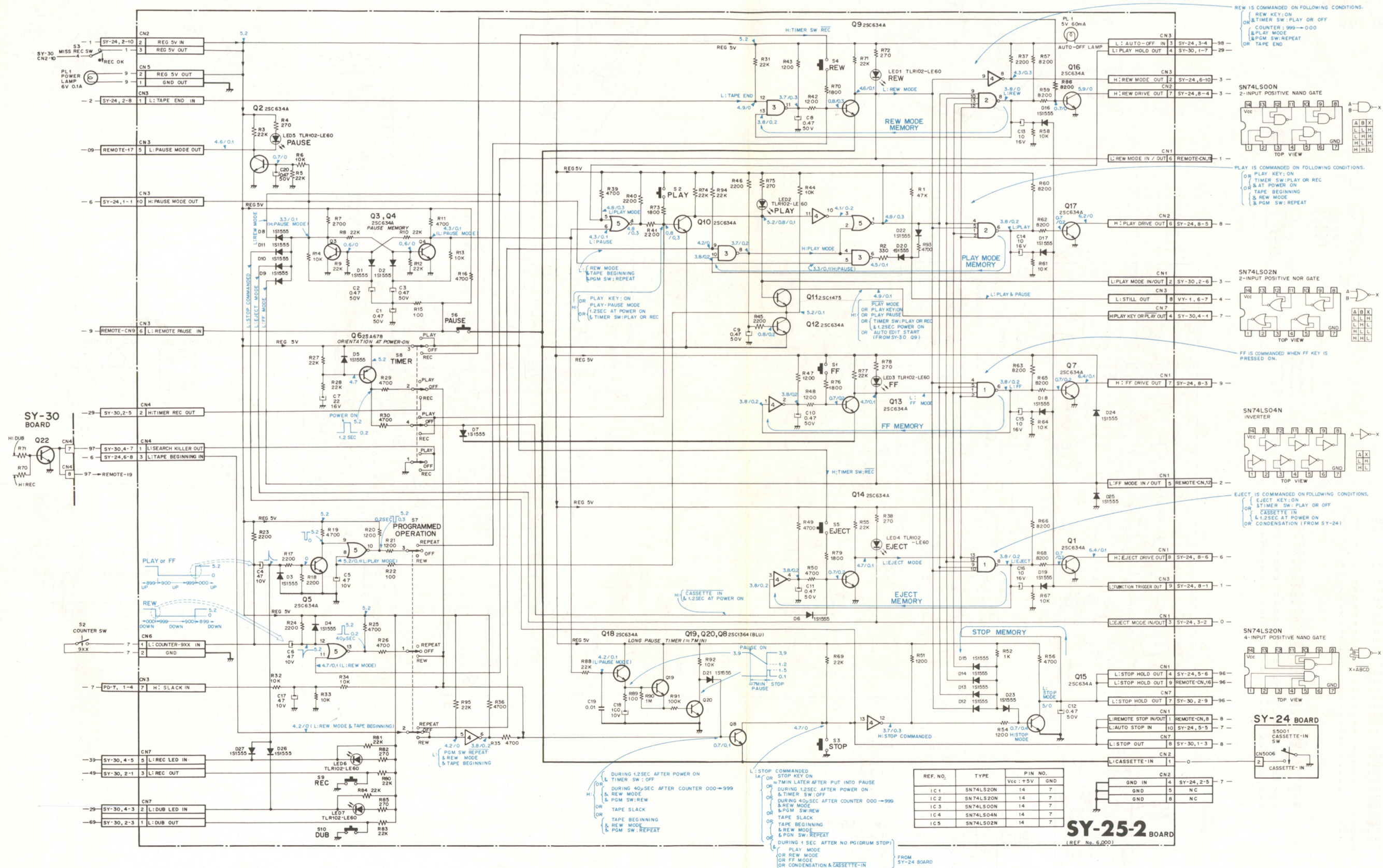


**SY-25-2 BOARD**      REF. NO. 6000 SERIES  
FUNCTION SYSTEM CONTROL-1  
- *SOLDERING SIDE* -





SY-25-2 BOARD  
FUNCTION SYSTEM CONTROL-1

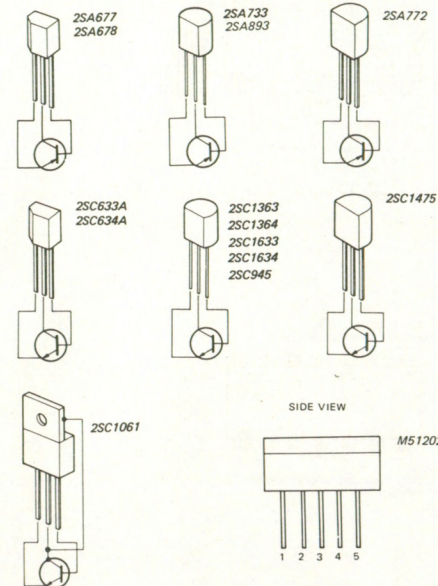
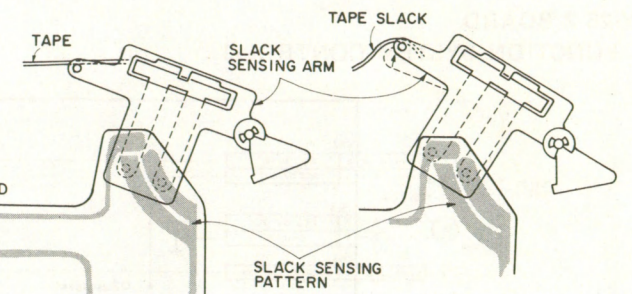
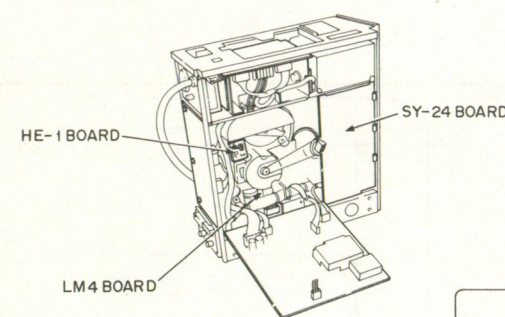
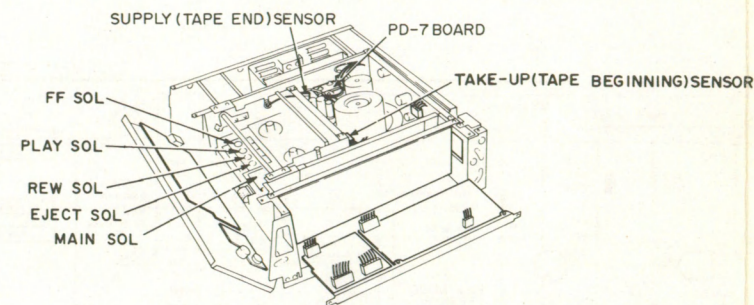


**NOTE:**

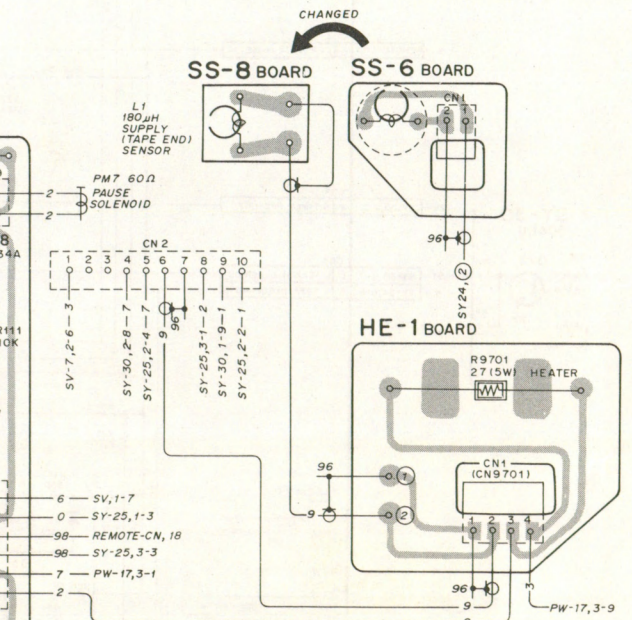
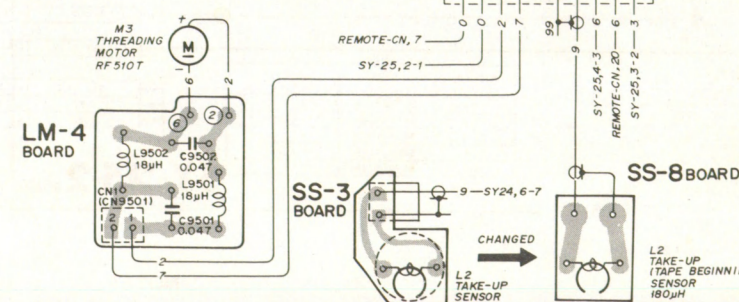
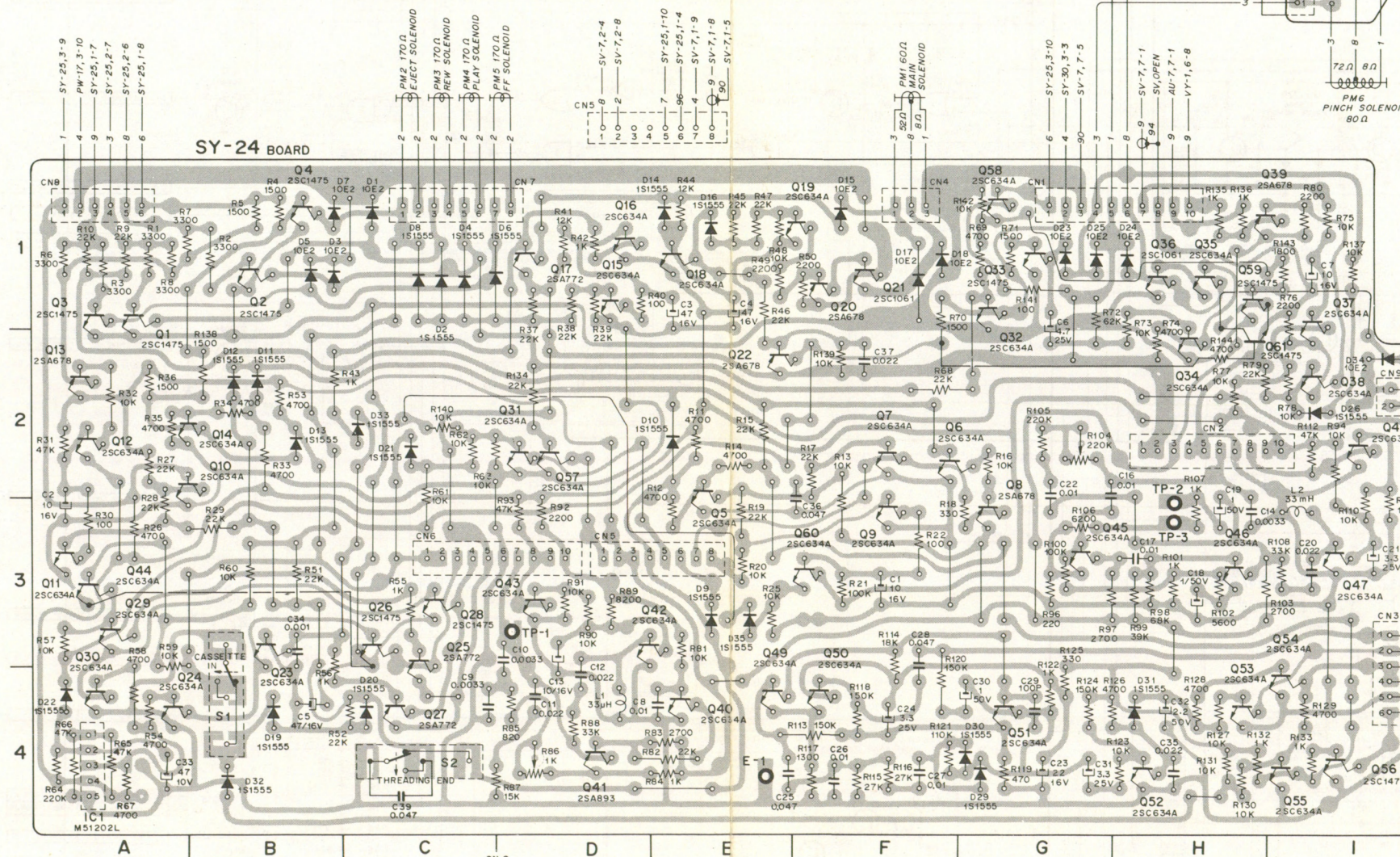
ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20k $\Omega$ /V).



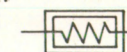
**SY-24 BOARD** REF. NO. 5000 SERIES  
**LM-4, PD-7, HE-1 SS-8, SS-6, SS-3 BOARD**  
 FUNCTION SYSTEM CONTROL-2  
 - SOLDERING SIDE -



|         |         |         |
|---------|---------|---------|
| CN1 H-1 | D34 I-2 | Q34 H-2 |
| CN2 H-2 | D35 E-3 | Q35 H-1 |
| CN3 I-4 |         | Q36 H-1 |
| CN4 F-1 | E-1 E-4 | Q37 I-2 |
| CN5 E-3 |         | Q38 I-2 |
| CN6 D-3 | IC1 A-4 | Q39 H-1 |
| CN7 C-1 |         | Q40 E-4 |
| CN8 A-1 | Q1 A-1  | Q41 D-4 |
| CN9 I-2 | Q2 B-1  | Q42 E-3 |
|         | Q3 A-1  | Q43 D-3 |
|         | Q4 B-1  | Q44 A-3 |
|         | Q5 E-2  | Q45 G-3 |
|         | Q6 F-2  | Q46 H-3 |
|         | Q7 F-2  | Q47 I-3 |
|         | Q8 G-3  | Q48 I-2 |
|         | Q9 F-3  | Q49 E-4 |
|         | Q10 B-2 | Q50 F-4 |
|         | Q11 A-3 | Q51 G-4 |
|         | Q12 A-2 | Q52 H-4 |
|         | Q13 A-2 | Q53 H-4 |
|         | Q14 B-2 | Q54 I-4 |
|         | Q15 D-1 | Q55 I-4 |
|         | Q16 D-1 | Q56 I-4 |
|         | Q17 D-1 | Q57 D-2 |
|         | Q18 E-1 | Q58 G-1 |
|         | Q19 F-1 | Q59 H-1 |
|         | Q20 F-1 | Q60 F-3 |
|         | Q21 F-1 | Q61 2   |
|         | Q22 E-2 |         |
|         | Q23 B-3 |         |
|         | Q24 A-4 |         |
|         | Q25 C-3 |         |
|         | Q26 C-3 |         |
|         | Q27 C-4 |         |
|         | Q28 C-3 |         |
|         | Q29 A-3 |         |
|         | Q30 A-4 |         |
|         | Q31 D-2 |         |
|         | Q32 G-1 |         |
|         | Q33 G-1 |         |



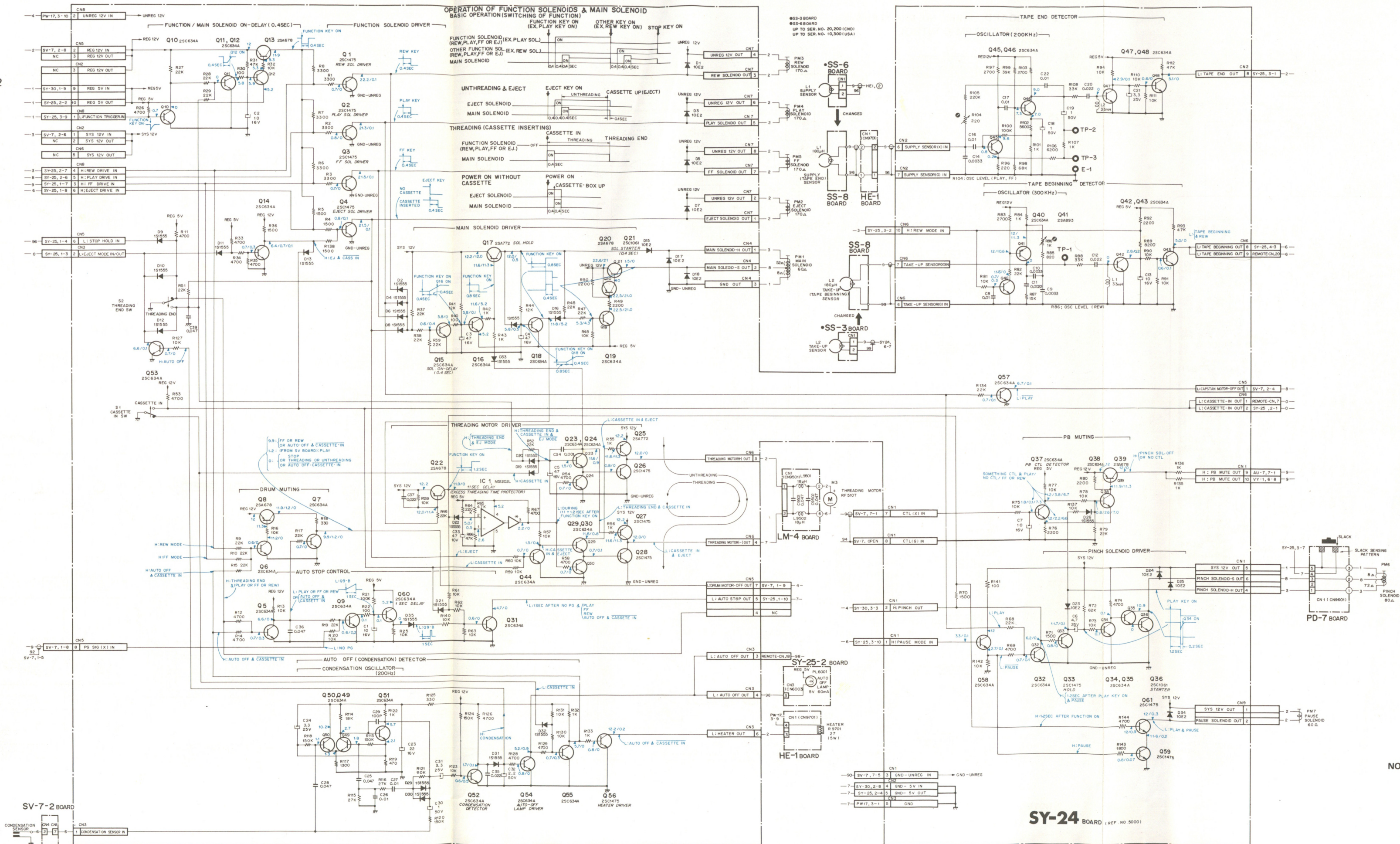
NOTE:



NONFLAMMABLE RESISTOR.



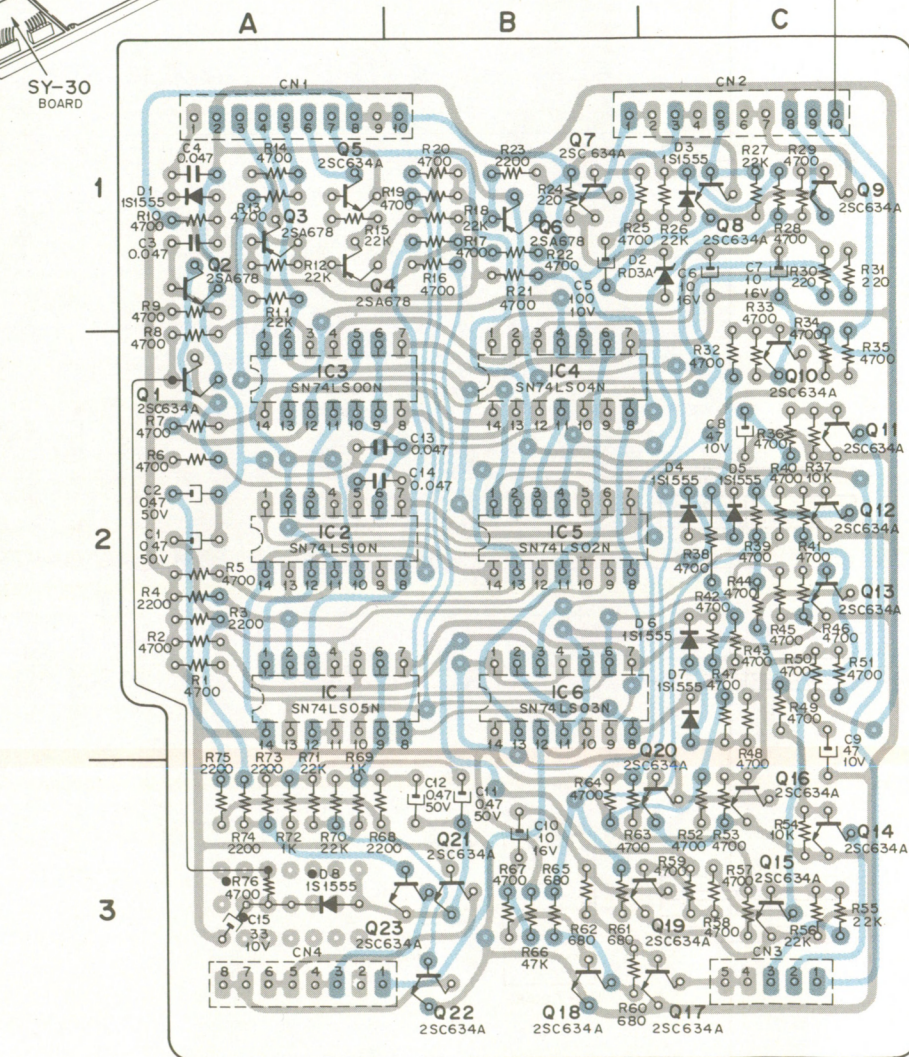
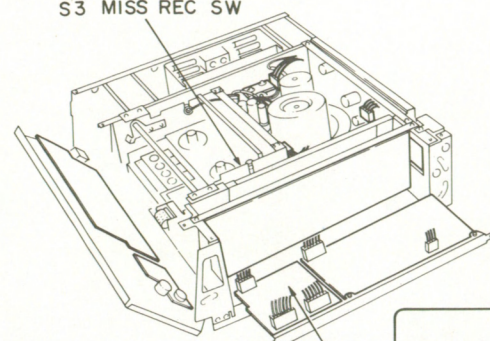
**SY-24 BOARD**  
**LM-4, PD-7, HE-1**  
**SS-8, SS-6, SS-3 BOARD**  
**FUNCTION SYSTEM CONTROL-2**





**SY-30 BOARD** REF. NO. 6500 SERIES  
REC/PB SYSTEM CONTROL  
— SOLDERING SIDE —

S3 MISS REC SW



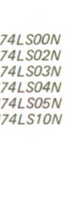
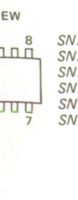
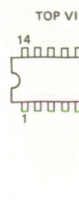
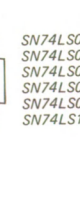
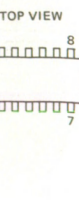
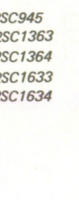
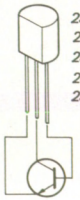
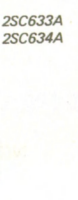
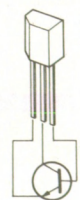
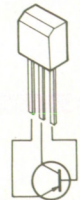
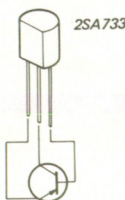
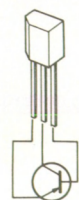
IC1 A-2  
IC2 A-2  
IC3 A-2  
IC4 B-2  
IC5 B-2  
IC6 B-2

Q1 A-2  
Q2 A-1  
Q3 A-1  
Q4 A-1  
Q5 A-1  
Q6 B-1  
Q7 B-1  
Q8 C-1  
Q9 C-1  
Q10 C-2  
Q11 C-2  
Q12 C-2  
Q13 C-2  
Q14 C-3  
Q15 C-3  
Q16 C-3  
Q17 C-3  
Q18 B-3  
Q19 C-3  
Q20 C-3  
Q21 B-3  
Q22 B-3  
Q23 B-3

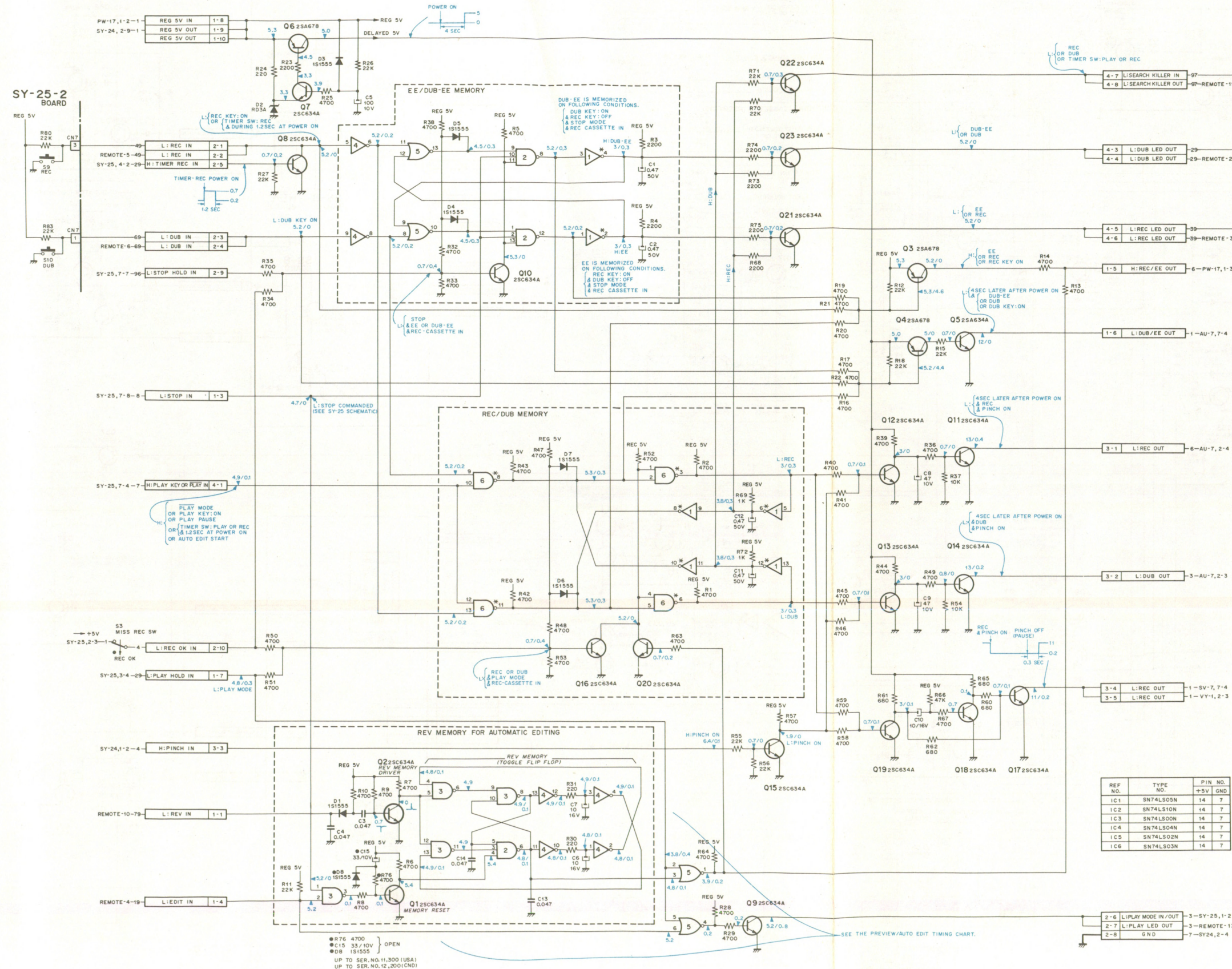
D1 A-1  
D2 C-1  
D3 C-1  
D4 C-2  
D5 C-2  
D6 C-2  
D7 C-2  
D8 A-3

CN1 A-1  
CN2 C-1  
CN3 C-3  
CN4 A-3

●R76 4700 } OPEN UP TO SER. NO. 11,300 (USA)  
●C15 33/10V } OPEN UP TO SER. NO. 12,200 (CND)  
●D8 1S1555



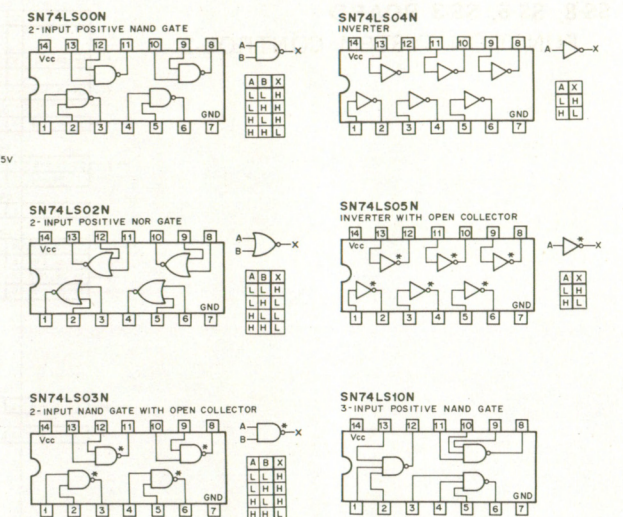
**SY-30 BOARD** REF. NO. 6500 SERIES  
REC/PB SYSTEM CONTROL



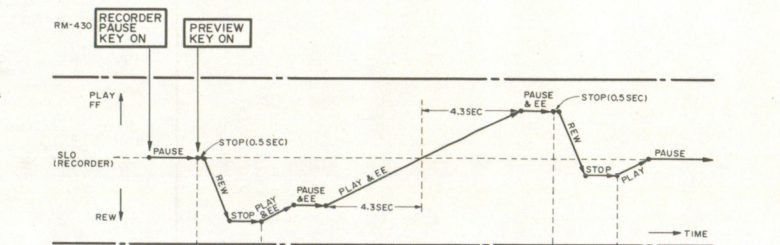
NOTE:

ALL VOLTAGES ARE DC, MEASURED WITH A VOM (20kΩ/V).

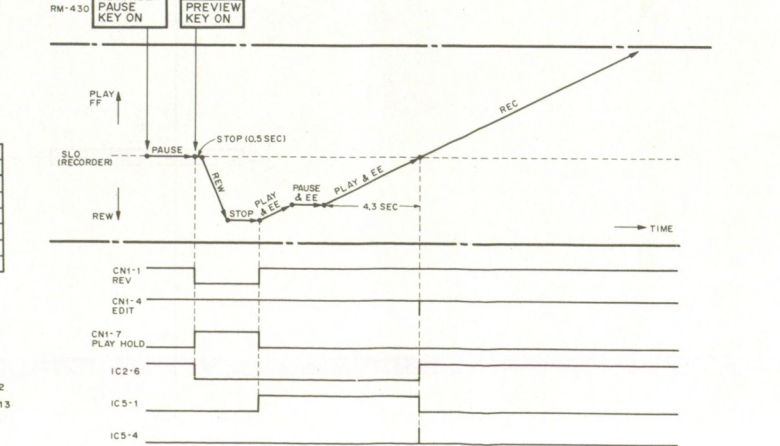
## SY-25-2 BOARD



## PREVIEW



## AUTO EDIT









# SECTION 4

## PERIODIC CHECK AND MAINTENANCE

It is recommended to perform the maintenance and the periodic check mentioned below for the best operation of the function and performance of the machine and for prolonging the lives of the machine and the tape.

### 4.1. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after the repair without regarding the operating hours of the machine.

#### (1) Cleaning of Video Heads

- Press chamois (Jig Ref. No. J-14) moistured with the cleaning fluid (Jig Ref. No. J-13) and turn the fan on the top of the drum slowly with the hand, cleaning the heads. (Never turn the motor by the electric power for the cleaning.)
- Never move the chamois in the vertical direction of the head tip in the cleaning. It tends to damage the head tips.

#### (2) Cleaning of tape running system

- Wipe the tape bearing surfaces (of the tape guide, drum, video head disk, capstan, and pinch roller) with a piece of chamois saturated with the cleaning fluid.

#### (3) Cleaning of drive system

- Wipe the drive system (such as belt, idler, and reel table surface) with a piece of chamois saturated with the cleaning fluid.

### 4.2. PERIODIC CHECK

Perform the maintenance checks described separately in accordance with the operational hours of the machine.

### 4.3. OTHERS

#### (1) SONY oil

- Be sure to use the SONY oil as the lubrication oil. (If oil other than the SONY oil is used, various troubles due to a different viscosity tends to be caused.)

SONY oil : Part No. 7-661-018-01  
(Mitsubishi diamond oil #440)

- Use the SONY oil in which dust or other foreign material have not mixed for lubricating the bearing. (If foreign material is in the oil, wear or burning of the bearing tends to be caused.)
- A drop of the lubrication oil in the following description is equal to an oil drop on a pick with 2 mm diameter as shown in the figure.

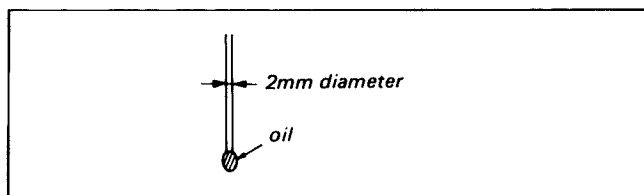


Fig. 4-1.

○ Cleaning    ⊙ Lubrication    ★ Replace    ◇ Check

| ITEM                |                                                    | OPERATING HOURS (H)  |     |      |      |      |      |      |      |      |      |      | REMARKS                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------|----------------------|-----|------|------|------|------|------|------|------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                    | REPLACEMENT PART NO. | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |                                                                                                                                                                                                                |
| Tape path system    | Tape path cleaning                                 | _____                | ○   | ○    | ○    | ○    | ○    | ○    | ○    | ○    | ○    | ○    | Perform whenever repair work is attempted.                                                                                                                                                                     |
|                     | Audio/CTL head cleaning degaussing                 | _____                | ○   | ○    | ○    | ○    | ○    | ○    | ○    | ○    | ○    | ○    |                                                                                                                                                                                                                |
|                     | Video heads (disk) cleaning degaussing and replace | A-6762-009-A         | ○   | ★    | ○    | ★    | ○    | ★    | ○    | ★    | ○    | ★    | Life of video head is effected extensively by operating ambient conditions                                                                                                                                     |
| drive/torque system | Bearing of Capstan Holder                          | _____                | —   | ⊙    | —    | ⊙    | —    | ⊙    | —    | ⊙    | —    | ⊙    | Apply a drop of SONY oil to upper & lower bearing respectively.                                                                                                                                                |
|                     | Lubrication to thrust bearing beneath reel table   | _____                | —   | —    | ⊙    | —    | —    | ⊙    | —    | —    | ⊙    | —    | Remove reel table. Apply a drop of SONY oil to thrust bearing.                                                                                                                                                 |
|                     | Capstan Belt cleaning and replace                  | 3-653-442-00         | ○   | ○    | ★    | ○    | ○    | ★    | ○    | ○    | ★    | ○    | <ul style="list-style-type: none"> <li>• Perform whenever repair work made other than left column.</li> <li>• Replace according to operating hours as shown in left column, or after every 2 years.</li> </ul> |
|                     | Belts other than Capstan Belt, cleaning replace    | See below            | ○   | ○    | ○    | ○    | ○    | ○    | ○    | ★    | ○    | ○    |                                                                                                                                                                                                                |
|                     | FWD limiter replace                                | X-3653-310-0         | —   | —    | ★    | —    | —    | ★    | —    | —    | ★    | —    |                                                                                                                                                                                                                |
|                     | Solenoid iron core cleaning                        | _____                | —   | —    | —    | ○    | —    | —    | —    | ○    | —    | —    | Clean the solenoid iron core and inside the coil with dry cloth.                                                                                                                                               |



| ITEM             |                                         | OPERATING HOURS (H)  |     |      |      |      |      |      |      |      |      |      | REMARKS                                                   |
|------------------|-----------------------------------------|----------------------|-----|------|------|------|------|------|------|------|------|------|-----------------------------------------------------------|
|                  |                                         | REPLACEMENT PART NO. | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |                                                           |
| functional check | excessive noise sound                   | _____                | ◇   | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | Adjust or replace parts causing noise                     |
|                  | measurement of FWD back tension         | _____                | —   | ◇    | —    | ◇    | —    | ◇    | —    | ◇    | —    | ◇    | 38g ~ 48g (with Jig Tape.) Measure according to sec. 7-4. |
|                  | Check the brake system                  | _____                | —   | ◇    | —    | ◇    | —    | ◇    | —    | ◇    | —    | ◇    | Check according to sec. 7-3.                              |
|                  | Playback and recording functional check | _____                | ◇   | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | ◇    | Perform whenever repair work is attempted.                |

- The Belts other than the Capstan Belt.  
 BELT, LM (Gear Box Ass'y) ; 3-653-387-00  
 BELT, EJECT ; 3-653-452-00  
 BELT, FWD ; 3-653-324-00  
 BELT, DRIVE ; 3-653-450-00  
 BELT, COUNTER ; 3-653-451-00

< Note > Regarding overhaul of equipment  
 When overhaul of an equipment is attempted, replace parts referring list. For the parts not listed in upper list, such as motors and heads, refer the following items.

Audio/CTL head ; approx. 3,000 hours  
 capstan dc motor ; approx. 2,000 hours  
 threading dc motor ; depending on threading times (more than 30000 threading operation)  
 Erase head ; approx. 4,000 hours



## SECTION 5

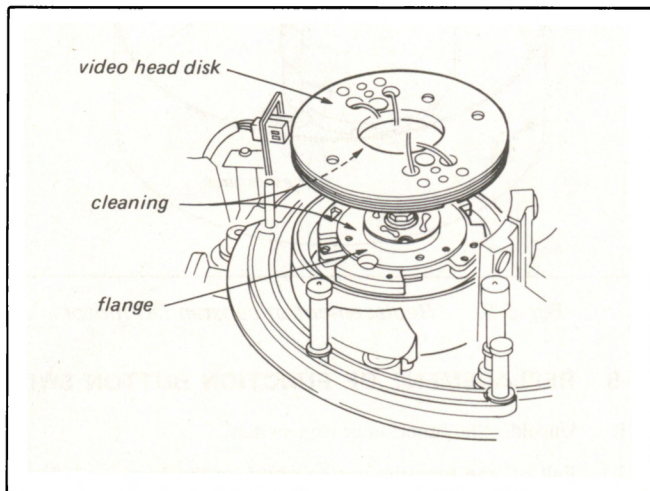
### REPLACEMENT OF MAIN PARTS

#### 5-1. REPLACEMENT OF VIDEO HEAD DISK (including the eccentricity adjustment)

The video head cannot be replaced as a single part. The video head disk must be replaced when the video head is required to be replaced.

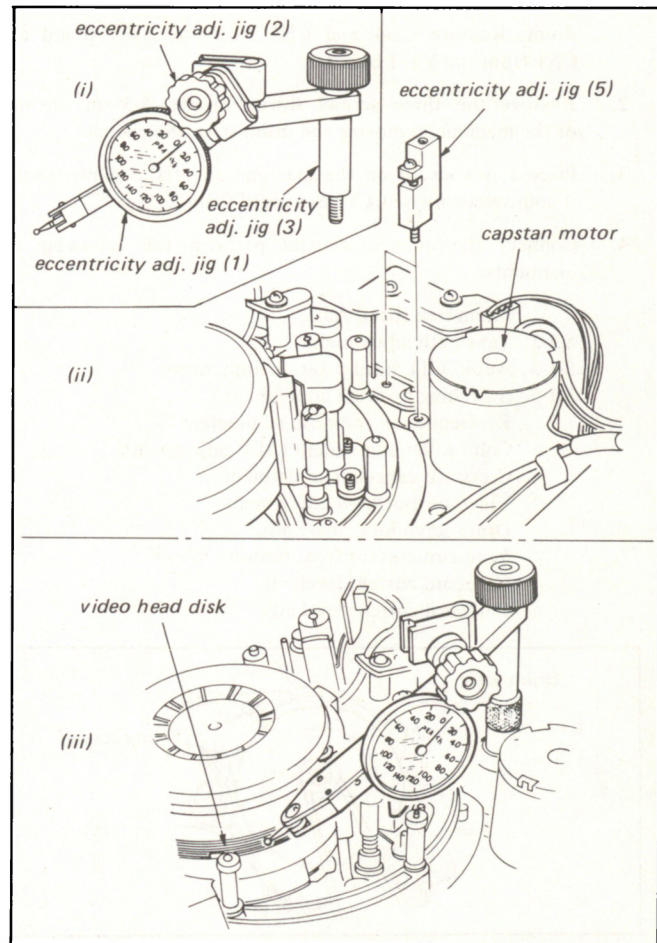
Never to loosen or tighten the nut at the center of the drum and the three setscrews.

1. Remove the fan that is screwed into the drum shaft, as holding the external circumference of the drum disk with finger.
2. Remove the upper drum. (Never to loosen the two cap screws at the lower section of the drum support.)
3. Unsolder the four lead wires of the video heads. And remove the video head disk.
4. Clean the drum flange and the mount surface of a new video head disk with a cloth moistured with methanol and mount the disk.



**Fig. 5-1. Replacement of video head disk**

5. Fix the video head disk temporarily and perform the eccentricity adjustment described below.
  - (i) Combine the drum eccentricity adjustment jigs (1), (2), and (3) (Jig Ref. No. J-1, 2, 3,) as shown in Fig. 5-2 (i).
  - (ii) Attach the drum eccentricity adjustment jig (5) (Jig Ref. No. J-4) as shown in the figure 5-2 (ii). Set the jig combined in Step (i) so that the tip of the pick test comes near the center of the video head disk.
  - (iii) Turn the center shaft of the drum slowly counter-clockwise (↺) with the fingers and confirm the swing width of the jig pointer is within  $5\mu$  during one turn of the drum. If it is within the specified value, proceed to Step 6. If not, adjust as follows.
  - (iv) Tap the outer circumference of the video head disk with something like the screwdriver whose handle is wrapped by cloth until the swing width becomes within  $5\mu$ .



**Fig. 5-2. Replacement of video head disk**

**Note:** Be careful not to give damage to the video head tip when tapping the circumference of the video head disk.

6. Tighten the two fixing screws that are securing the video head disk gradually and alternately after the adjustment. (Tightening torque; more than  $10\text{ kg}\cdot\text{cm}$ )
7. Confirm again that the eccentricity is within  $5\mu$  after the tightening the screws.
8. Reconnect the four leads to the heads while pressing the height adjusting screw of the upper drum.
9. Perform the following adjustments after the video head disk replacement.
  - 8-3. Video head dihedral adjustment
  - 8-1-1. Tape path adjustment
  - 8-1-4. Audio/CTL head position adjustment
  - 8-1-5. Switching position adjustment
  - RF frequency response adjustment
  - Color killer adjustment (ACC adjustment)
  - Crosstalk canceller adjustment
  - Video output level adjustment
  - Drum servo lock phase adj.
  - Y. record current freq. response check
  - Y. record current level adj.
  - C. record current level adj.



## 5-2. DRUM REPLACEMENT

1. Remove the connectors of the leads connected to the drum; Remove CN4 and CN5 from the SV-7 board and CN1 from the VY-1 board
2. Remove the three screws shown in Fig. 5-3 on the rear of the machine, removing the drum from the chassis.
3. Place a new drum on the machine and fix it while turning it counterclockwise (↺) as viewed from its top.
4. Connect the connectors and perform the following adjustments.

Drum free speed Adj.

- 8-1-1. Tape path adjustment
- 8-1-4. Audio/CTL head position adjustment
- 8-1-5. Switching position adjustment
- RF frequency response adjustment
- Color killer adjustment (ACC adjustment)
- Crosstalk canceller adjustment
- Video output level adjustment
- Drum servo lock phase adj.
- Y. record current freq. response check
- Y. record current level adj.
- C. record current level adj.

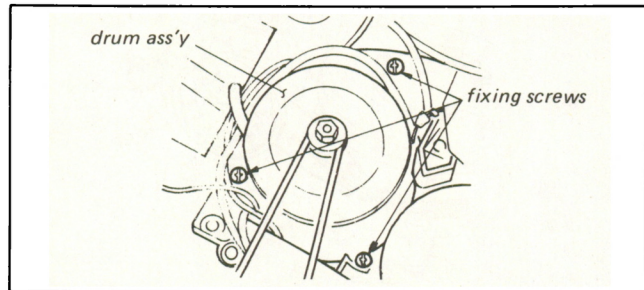


Fig. 5-3. Drum replacement

## 5-3. REPLACEMENT OF GEAR BOX

The construction of the gear box is different depending on the SLP-300, SLO-320, and SLO-340 but the one of the gear box for a maintenance purpose is standardized. When it is mounted to the SLO-320, the following parts must be removed from it prior to the mounting. If it is mounted without the parts removed, creaks are heard during the threading and unthreading.

1. Remove the parts shown in the figure.

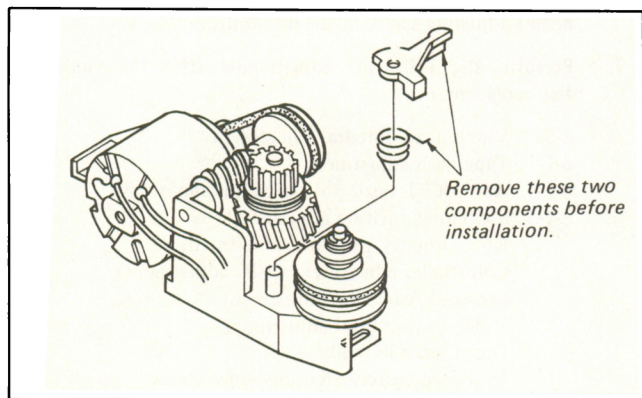


Fig. 5-4. Replacement of gear box

2. Perform the below adjustment after the replacement.
- 6-3-2. Gear box position adjustment

## 5-4. REPLACEMENT OF CAPSTAN DC MOTOR

1. Remove the shield plate from the defective motor and attach it to a new replacement motor.
2. Remove the capstan pulley from the defective motor and attach it to the new motor as shown in the Fig. 5-5.
3. Perform the adjustment below after the replacement.  
Capstan free speed adjustment

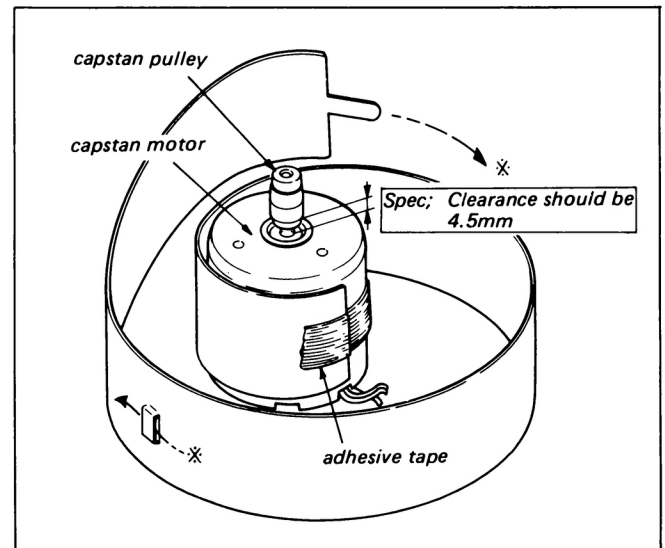


Fig. 5-5. Replacement of capstan DC motor

## 5-5. REPLACEMENT OF FUNCTION BUTTON SWITCH

1. Unsolder the function button switch.
2. Pull off the function button switch in the direction indicated by the arrow while pushing the two claws on each side of the switch in the direction shown by the arrow as shown in Fig. 5-6.
3. Insert a new function button switch until the claws lock the keyboard chassis and solder it to the SY-25 board.

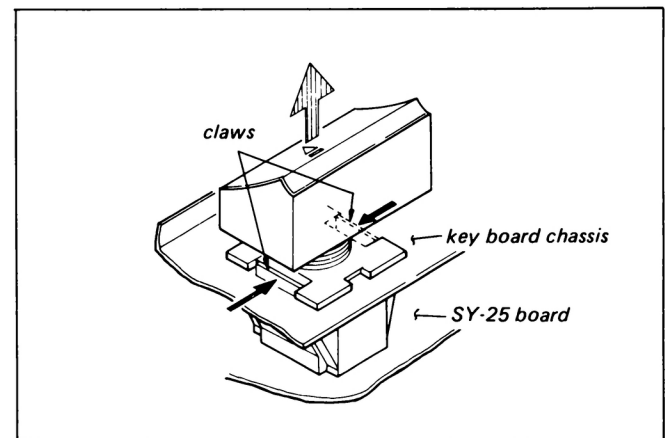


Fig. 5-6. Replacement of function button switch



## 5-6. TENSION REGULATOR ARM REPLACEMENT (including adjustment)

- Tension regulator arm has much influence over tape interchangeability between multiple machines. When replacement of tension regulator arm is attempted, perform it deliberately.

1. When replacing the parts that are surrounded by the dotted line of Fig. 5-7, remove screws or stop-ring shown by the \* mark in the same figure. Never try to touch the screw marked with •.
2. When replacing parts that are other than what are surrounded by the dotted line in Fig. 5-7, perform following adjustments carefully.

**Note:** This adjustment is based on the references that are tape guide, the tape guide (E) and tape guide (A) located on both neighbours of the arm. Do not touch them this adjustment is complete.

- (i) As shown in Fig. 5-7, the tension regulator should be in parallel with both tape guide (E) and tape guide (A). This is adjusted by two screws marked by •.
- (ii) Playback the alignment tape (KR5-1; Jig Ref. No. J-12). Observe rf waveform referring sec. 8-1-1. Turn the TRACKING control ⤴ and ⤵ from its FIX position and check to see that rf waveform increases and decreases while maintaining flat envelope as TRACKING control is turned. If not, adjust finely by means of a screw marked by •. Do not turn this screw more than 90°. Adjust it in the range of 90° turning.
- (iii) Adjust sec. 8-1-1 Tape Path, but never touching screw marked by •.

3. After replacement, perform the following adjustment.

6-7 Tension Regulator Arm Position Adj.

7-4 FWD Back Tension Adj.

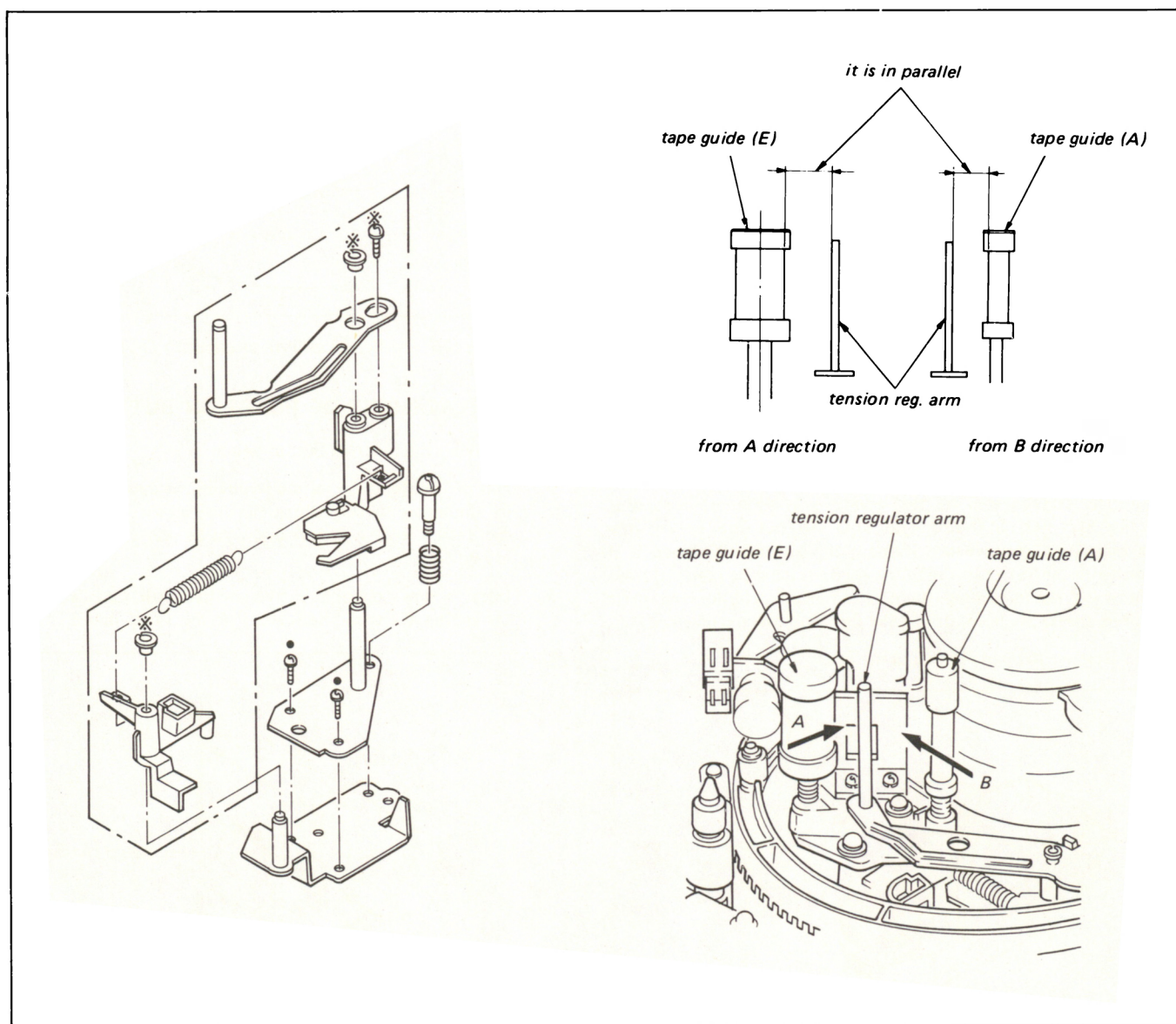


Fig. 5-7. Replacement of tension regulator arm



## SECTION 6

# LINK AND DRIVE SYSTEM ALIGNMENT

### 6-1. REEL TABLE HEIGHT ADJUSTMENT

- Reel table height should be adjusted precisely as it is utilized as the reference of the tape running system.
- Perform the check and adjustment of the supply and take-up reel table height with the same procedure.

#### (Check Procedure)

1. Measure the reel table height with vernier calipers as shown in Fig. 6-1 and check that height is within specifications.

If not, follow the adjustment procedure below.

#### (Adjustment Procedure)

2. Add or remove the height adjustment spacer under the reel table for the height adjustment.

- Height adjustment spacer  
Part Code No. 3-701-441-01

Diameter ..... 4 mm, thickness ..... 0.13 mm

**Note:** Any washer having internal diameter 4 mm and external diameter of less than 9 mm can be used for this purpose.

3. Tighten the securing screw on top of the reel table. Check then that the reel table has vertical play of more than 0.2 mm, by moving the reel table in the direction shown by the arrow.

If vertical play does not meet specifications of 0.2 mm, adjust the reel table for the lowest height within specifications by step 2 and check again by step 3.

### 6-2. SOLENOID POSITION ADJUSTMENT

#### 6-2-1. Main Solenoid Position Adjustment

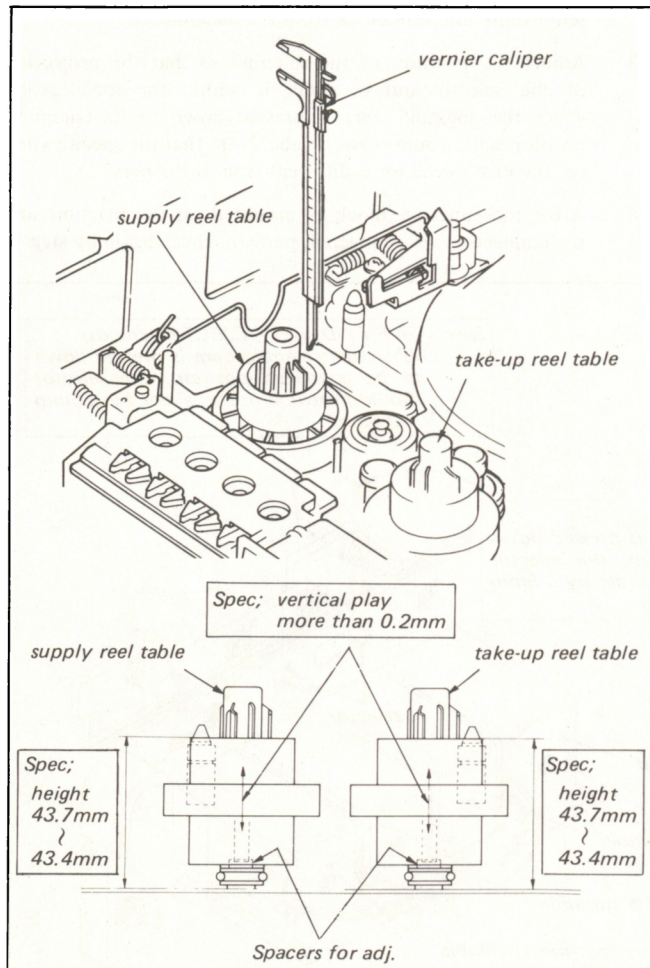
If this adjustment is incorrect, the mechanical link system cannot move to the specified location completely, or insufficient release of the brakes and poor idler pressure will be the result.

#### (Check Procedure)

1. Set up the STOP mode without a cassette. (See section 2-3.)
2. Press the REW button to set up the REWIND mode and confirm then that the position of the hole on the function block shown in Fig. 6-2 satisfies the specification. If not, perform the adjustment by the following procedure.

#### (Adjustment Procedure)

3. Remove the SY-25 board connector CN4 (a black connector connected from the tape timer) and open the front panel block which the SY-25 board is mounted on.
4. Set up the REWIND mode and adjust the main solenoid position for satisfying the specification shown in Fig. 6-2.



**Fig. 6-1. Reel table height adj.**  
(EJECT & POWER : OFF mode)



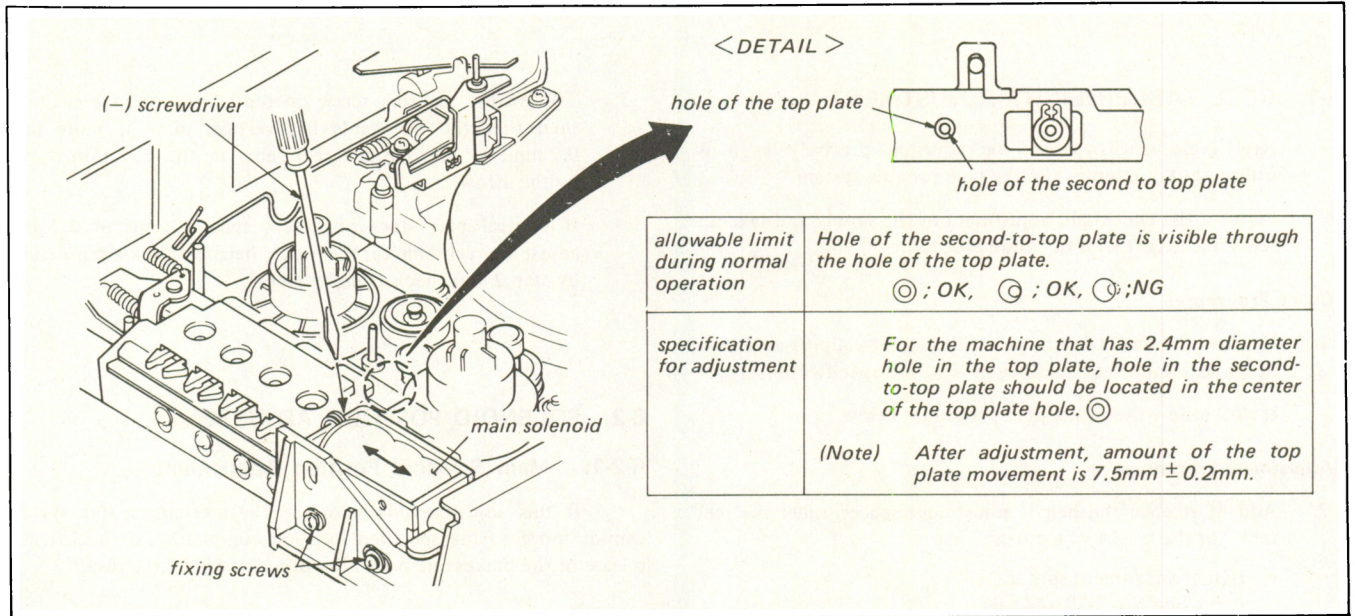


Fig. 6-2. Main solenoid position adj. (REW mode without a cassette)

### 6-2-2. Function Solenoid Stroke Adjustment

#### (Check Procedure)

1. Insert the cassette into the machine. Press each of the F-FWD, PLAY, REW, and EJECT buttons, and confirm that the tape runs normally in the mode corresponding to the button pressed and that unthreading operation is correctly performed.  
If an abnormal running is observed, perform the adjustment below.

#### (Adjustment Procedure)

2. Disconnect SY-24 board connectors CN-4 and CN-7, and remove the function block from the machine.
3. Adjust the position of the solenoid so that the projection of the selector out of slider is within the specification when the solenoid core is pressed down to its energized position with a screwdriver blade. Note that the specification for the PLAY selector is different from the others.
4. After the function block is mounted on the machine and the connectors are connected, perform check again by step 1.

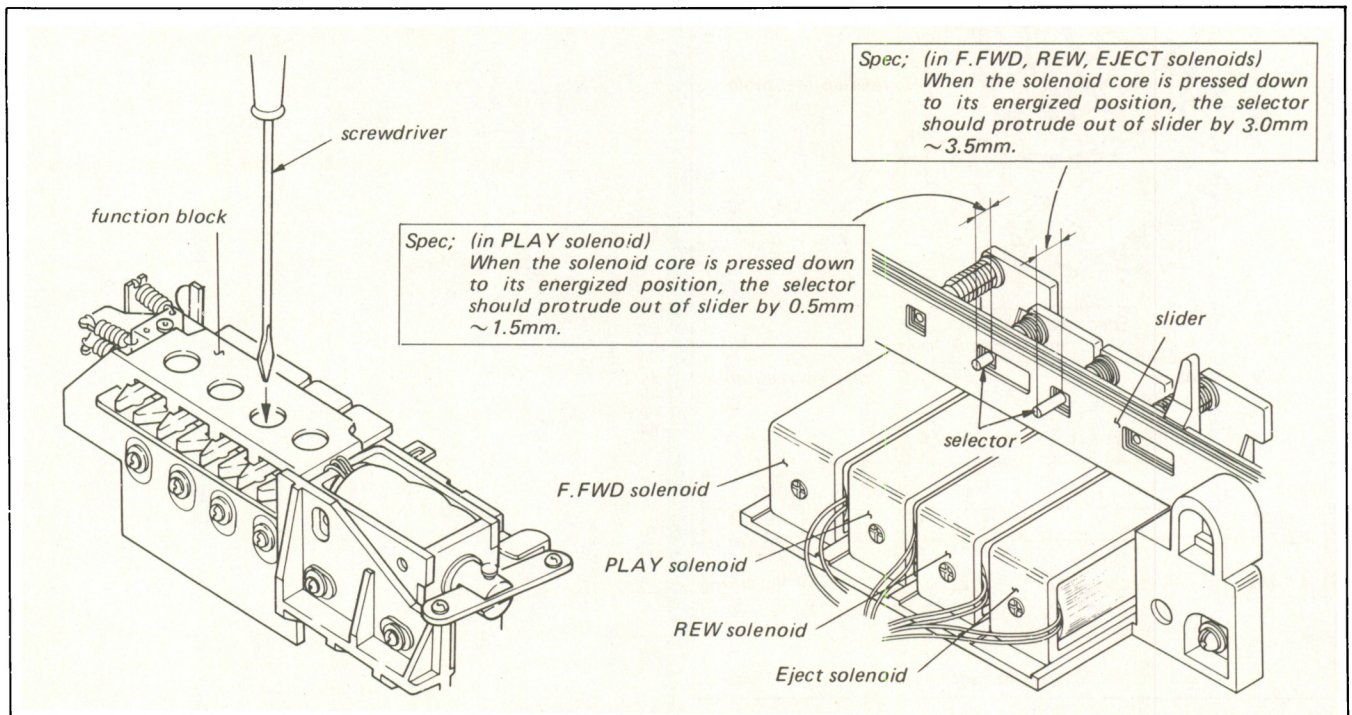


Fig. 6-3. Function solenoid stroke adj. (Remove the function block from the machine)



## 6-3. THREADING/UNTHREADING ADJUSTMENT

### 6-3-1. Cassette-in Det. Switch Operation Check

1. Press down top of the cassette-in detector probe slowly with the finger. See Fig. 6-4.
2. Check to hear a click sound when the SY-24 board micro-switch under the cassette-in detector probe is turned on.
3. Confirm that the probe can move more than 1 mm from the position where the click sound is heard, as the probe is further pressed down.  
If not, correct the mounting of the microswitch on the SY-24 board or replace it with a specified part.

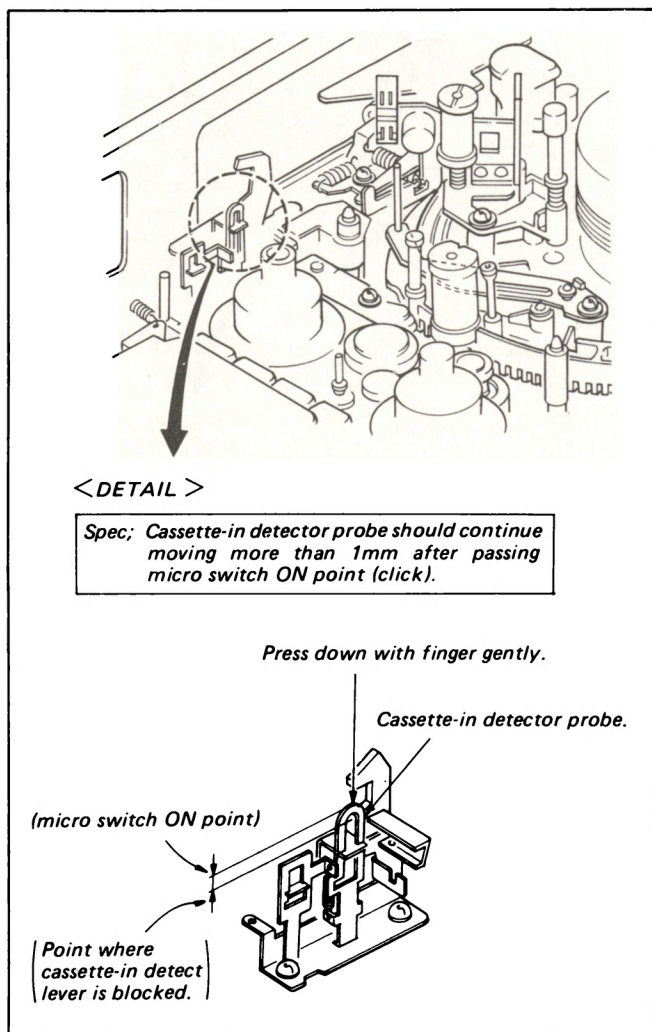


Fig. 6-4. Cassette-in detect switch operation check (Power; OFF mode)

### 6-3-2. Gear Box Position Adjustment

- If a correct spacing between threading ring and drive gear of gear box assembly, is not observed, possible trouble is no smooth threading or no smooth unthreading.
1. Press the cassette-in detector probe with the finger to make the machine thread and release the finger from it at the position where the pinch roller moves about 10 mm from its EJECT completed position.

2. Loosening the mounting screws of the gear box. While pushing the drive gear toward the threading ring, push the drive gear together with the threading further toward the gear box and tighten the mounting screws of the gear box. (Purpose of pushing the drive gear toward threading ring is to have clearance of 0.2 mm between the gear box and threading ring where 0.2 mm clearance is the play that the threading has in mounting.)

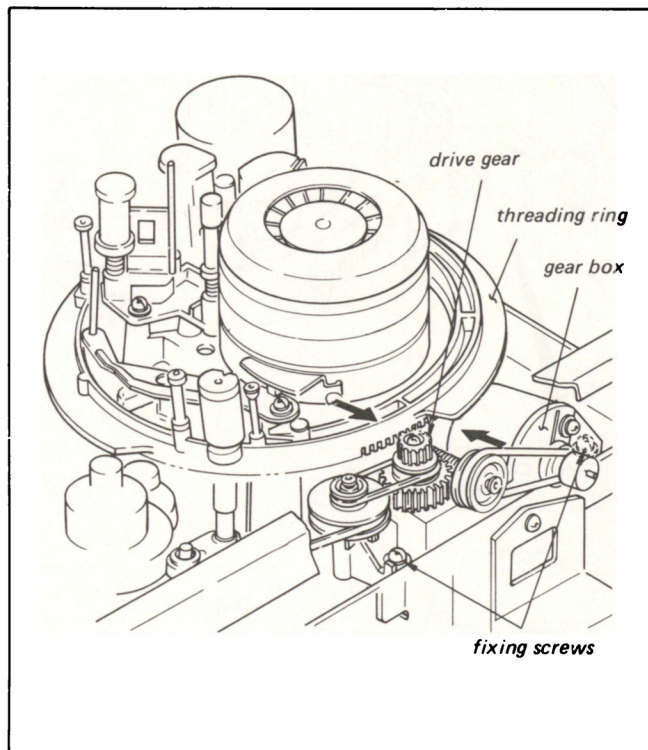


Fig. 6-5. Gear box position adj.  
(Threading without a cassette, but threading until halfway.)

LINK & DRIVE

### 6-3-3. Cassette Compartment Arm Clearance Adjustment

- If the cassette compartment arm touches the threading ring strongly due to lack of proper adjustment the arm clearance, threading/unthreading operations cannot be performed smoothly. If there is too much clearance, the locking of the cassette-up assembly may become loose.

#### (Check Procedure)

1. Set up the STOP mode without a cassette. (See section 2-3.)
2. Insert the thickness gauge into the clearance shown in Fig. 6-6 between the roller of cassette compartment arm (2) and the threading ring. Confirm the specification. If not, adjust as follows.

#### (Adjustment Procedure)

3. While pressing the cassette compartment arm (1) in the arrow direction, perform adjustment by turning a flat-head (–) screw driver in the arrow direction, until specification is satisfied.
4. After the adjustment, confirm the clearance stated in Step 2.



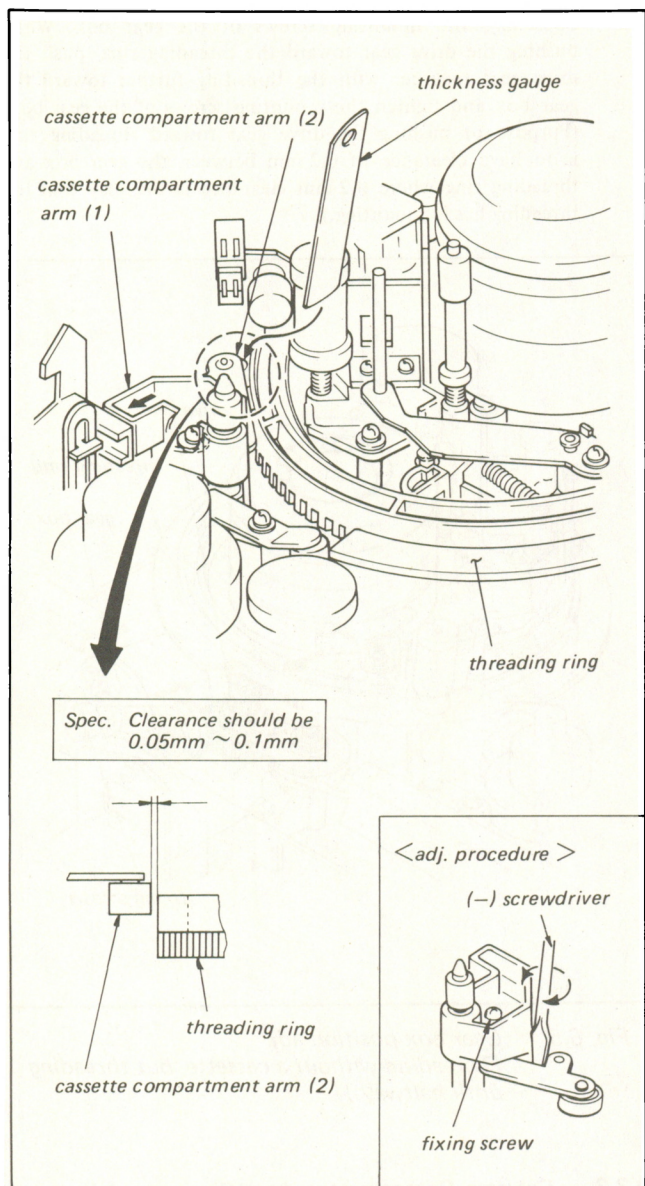


Fig. 6-6. Cassette compartment arm clearance adj.  
(STOP mode without a cassette)

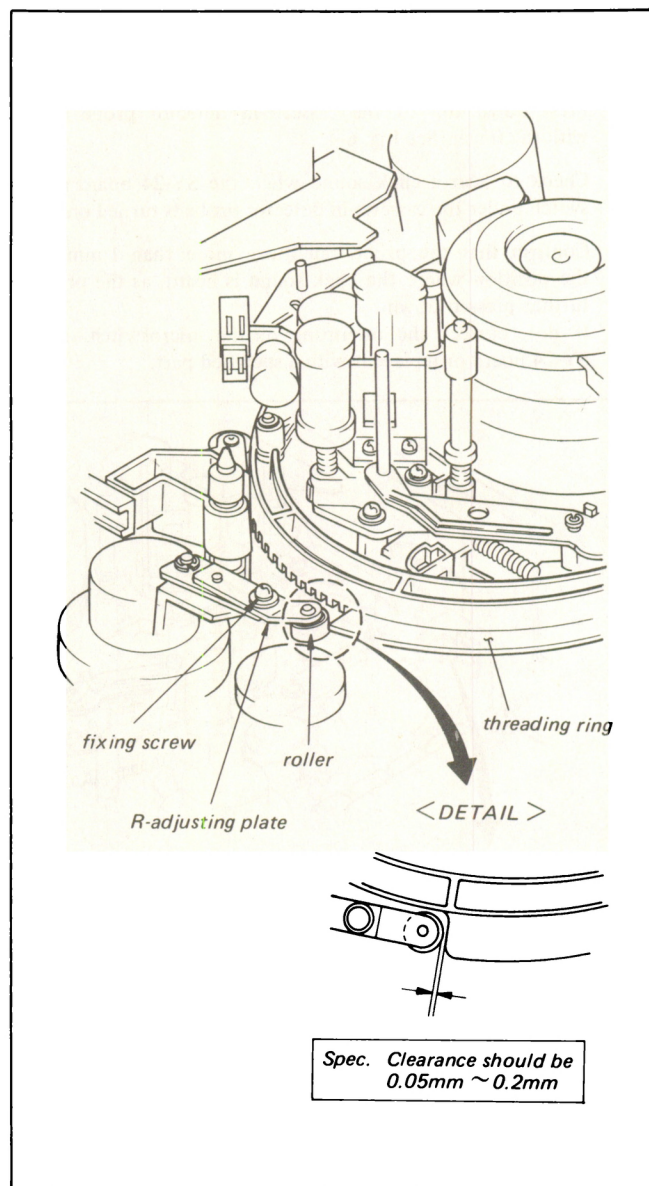


Fig. 6-7. Ring arm clearance adj.  
(STOP mode without a cassette)

#### 6-3-4. Ring Arm Clearance Adjustment

The ring arm interlocks with the threading-end switch. Poor adjustment of this clearance will result in the state that the threading ring motor does not stop after completion of threading.

##### (Check Procedure)

1. Set up the STOP mode without a cassette. (See section 2-3.)
2. Confirm that the clearance between the roller of the R-adjusting plate and the threading ring is within the specification as shown in Fig. 6-7.  
If not, adjust as follows.

##### (Adjustment Procedure)

3. Move the mounting position of the R-adjusting plate for the adjustment.

#### 6-3-5. Check of Unthreading Completion

1. Set up the STOP mode without a cassette and press the EJECT button to set up the EJECT completed mode.
2. Check to see that the roller moves in the direction shown by the arrow as the Cassette Compartment Arm (2) is pushed in the direction shown by the arrow.
3. Check to see that the tension regulator arm touches the boss of the threading ring as shown in Fig. 6-8.



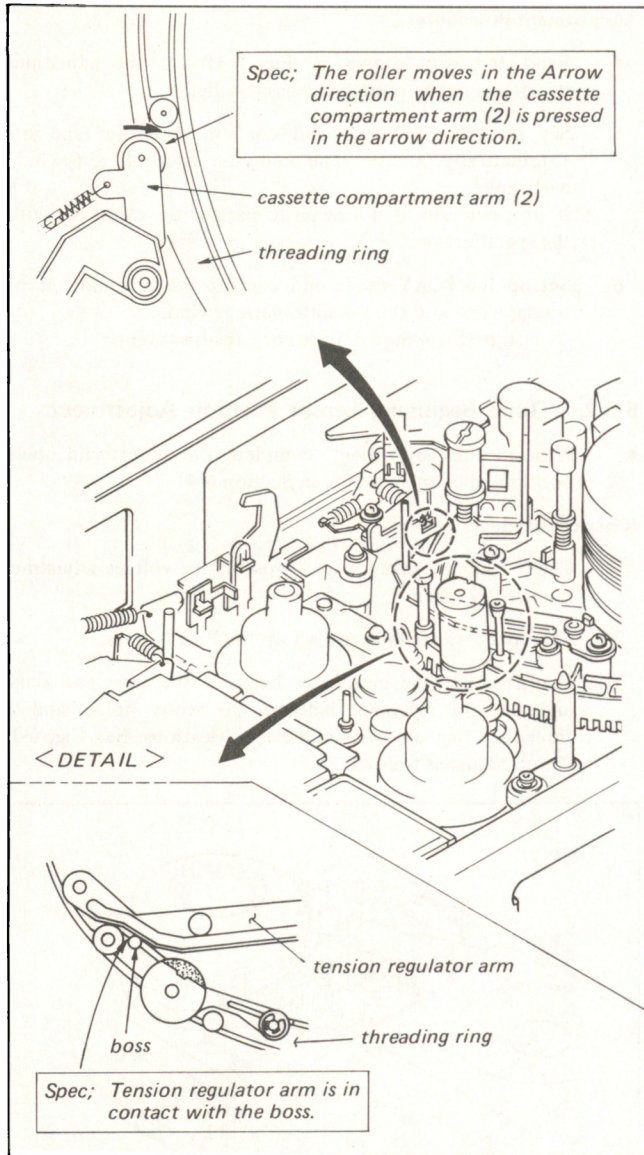


Fig. 6-8. Check of unthreading completion  
(EJECT completed mode without a cassette)

#### 6-4. CASSETTE LID OPENER POSITION ADJUSTMENT

- This cassette lid opener is employed for the purpose of positioning the cassette-up assembly and the positioning the tape beginning sensor.
- Two adjustment procedures for each of a machine with the cassette-up assembly attached and the one without the assembly are described. Select the adjustment procedure suitable for your case.

##### [Check Procedure]

1. When the cassette-up assembly is attached;  
Check that there is the plate of the cassette-up assembly near the center of the groove of the white plastic holder guide when the cassette-up assembly is placed down.  
If the specification is not satisfied, perform steps 3 and 4.
2. When the cassette-up assembly is not attached;  
Perform steps 4 and 5.

##### [Adjustment Procedure]

3. When the cassette-up assembly is attached;  
Adjust the position of the cassette lid opener so that the holder guide section satisfies the specification and the opener is in parallel to the side plate.
4. When the cassette-up assembly is not attached;  
Mount the cassette lid opener so that it is in parallel to the side plate and positions at the center of the long slot for the mounting. Attach the cassette-up assembly and confirm what described in step 1.
5. After the adjustment, perform the tape beginning sensor position adjustment in Section 6-5-2.

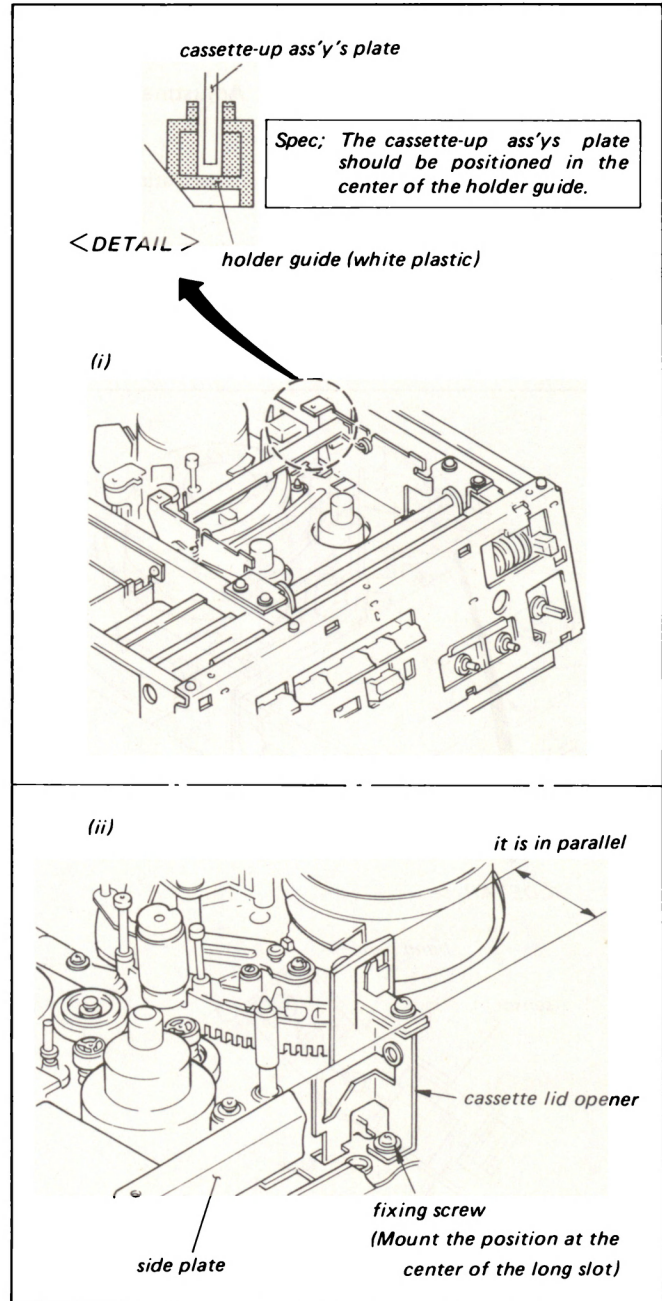


Fig. 6-9. Cassette lid opener position adj.  
(EJECT completed mode without a cassette)



## 6-5. TAPE SENSOR POSITION ADJUSTMENT

- This adjustment includes two adjustments. One is for the supply side tape end sensor while the other is for the take-up side tape beginning sensor. The tape end sensor detects the tape end during the PLAY and F-FWD modes. The tape beginning sensor detects the tape end (tape top in reference to the wind diameter) during the REW mode.
- The tape end sensor oscillates at about 300 kHz while the tape beginning sensor at about 200 kHz. When the metal foil such as the splicing tape passes the sensor, the sensor oscillation is stopped and the tape running is automatically stopped. If the clearance between the tape and the sensor is more than the specified value, the auto-stop will not take place, resulting in tape damage.

### 6-5-1. Tape End Sensor Position Adjustment

#### (Check Procedure)

1. Confirm that the supply sensor oscillating level is of required value.
2. Thread a cassette tape and set up the PLAY mode.
3. Confirm that clearance between tape and sensor is as specified in Fig. 6-10.  
If not, adjust as follows.

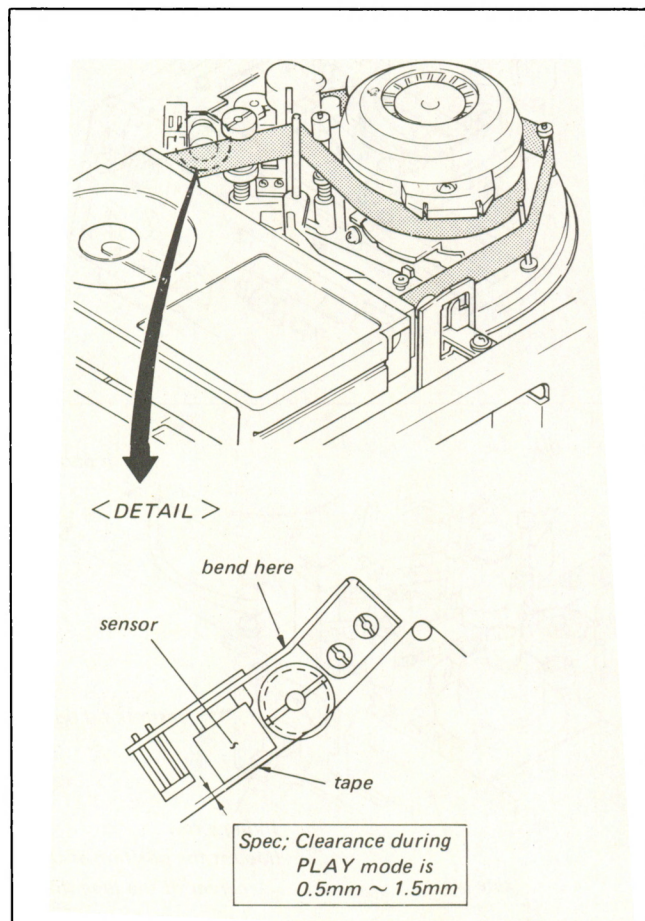


Fig. 6-10. Tape end sensor position adj.  
(PLAY mode with a cassette)

#### (Adjustment Procedure)

4. Bend the part shown in Fig. 6-10 for the adjustment.  
Be careful not to scratch the guide roller.
5. Set up the FF mode and confirm that the tape stops automatically at the tape end and the full autowind is performed.  
If not, perform Step 4 again to narrow the clearance within the specification.
6. Set up the PLAY mode and confirm the automatic stop at the tape end and the full automatic rewind.  
If not, perform Step 5 again for a readjustment.

### 6-5-2. Tape Beginning Sensor Position Adjustment

- Prior to this adjustment, complete the cassette lid opener position adjustment stated in Section 6-4.

#### (Check Procedure)

1. Check that the take-up sensor oscillating voltage adjustment is correctly made.
2. Thread a cassette tape and set up the PLAY mode.
3. Confirm that the clearances between the tape and sensor and also the clearance between the sensor holder and the threading ring are within the specifications. See Fig. 6-11.  
If not, adjust as follows.

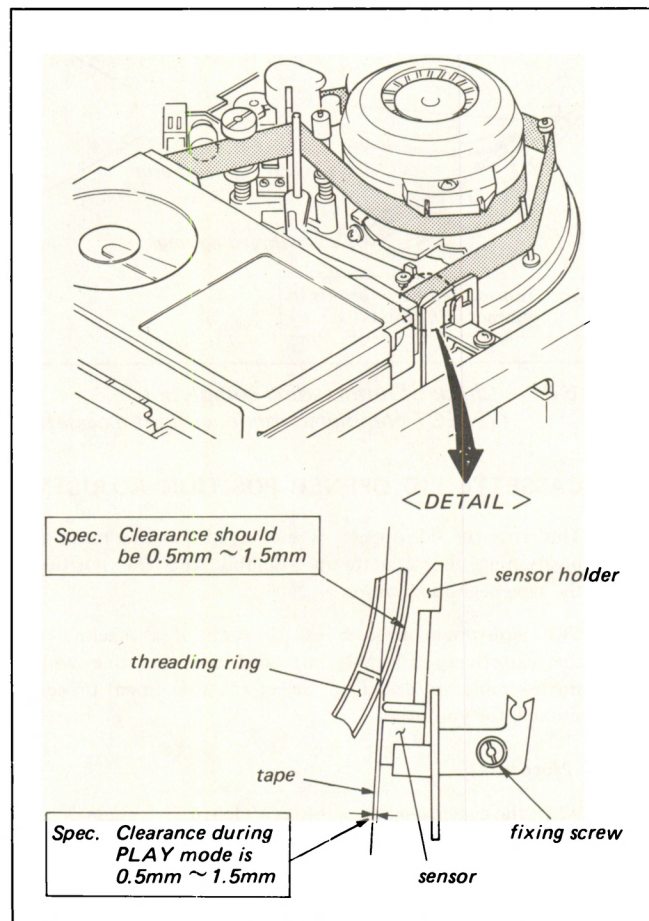


Fig. 6-11. Tape beginning sensor position adj.  
(PLAY mode with a cassette)



#### (Adjustment Procedure)

4. Move the sensor holder for the position adjustment.
5. Set up the FF mode. Confirm that the tape is not touching the sensor and the sensor holder. If it does, readjust the sensor holder.
6. Set up the REW mode. Confirm that the automatic stop is performed at the tape rewind end (i.e. tape top because all the tape is rewound).  
If not, narrow the clearance within the specification by performing Step 4.

### 6.6. PINCH ROLLER PRESSURE ADJUSTMENT

#### (Check Procedure)

1. Stop the slack sensor function. (See section 2-4.)
2. Set up the PLAY mode without a cassette. (See section 2-3.)
3. Confirm that the clearance shown in Fig. 6-12 satisfies the specification. If not, adjust as follows.

#### (Adjustment Procedure)

4. Perform adjustment by turning the screwdriver in the direction indicated by the arrow in Fig. 6-12. Loosen the fixing screws about 1/3 to 1/2 turn and do not loosen too much.
5. Perform Step 3 again after the fixing screws are tighten.

**Note:** Do not change the position of the spring stay.

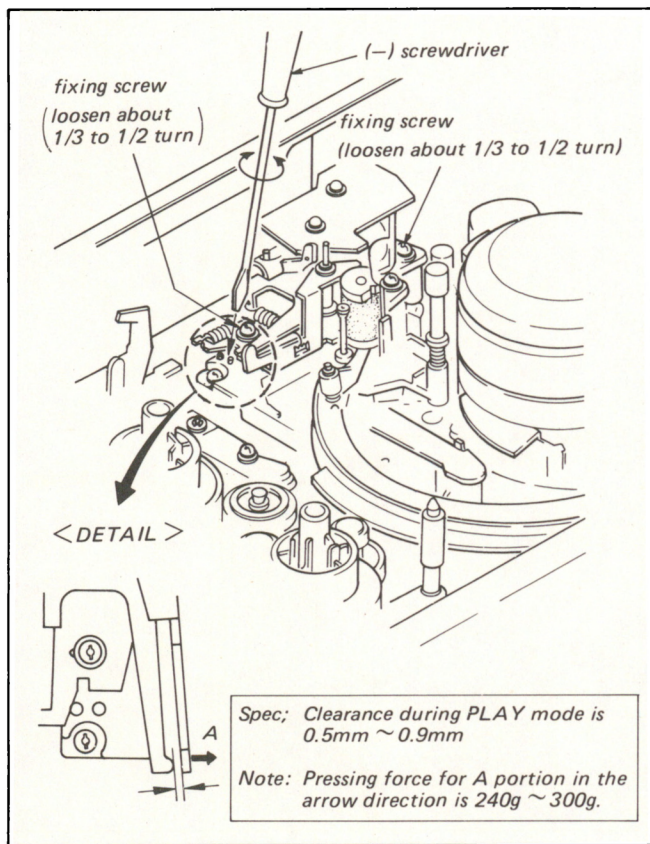


Fig. 6-12. Pinch roller pressure adj.  
(PLAY mode without a cassette)

### 6-7. TENSION REGULATOR ARM POSITION ADJUSTMENT

#### [Check Procedure]

1. Set up the PLAY mode without the cassette.
2. Confirm that the tip of the tension regulator arm satisfies the specification shown in Fig. 6-13.  
If not, perform the following procedure.

#### [Adjustment Procedure]

3. Loosen the mounting screw of the tension regulator band base by 1/6 to 1/4 turn.
4. Move the position of the tension regulator band base with a (-) screwdriver as shown in Fig. 6-13 so that the specification is satisfied.
5. After the adjustment, perform the FWD back tension adjustment stated in Section 7-4.

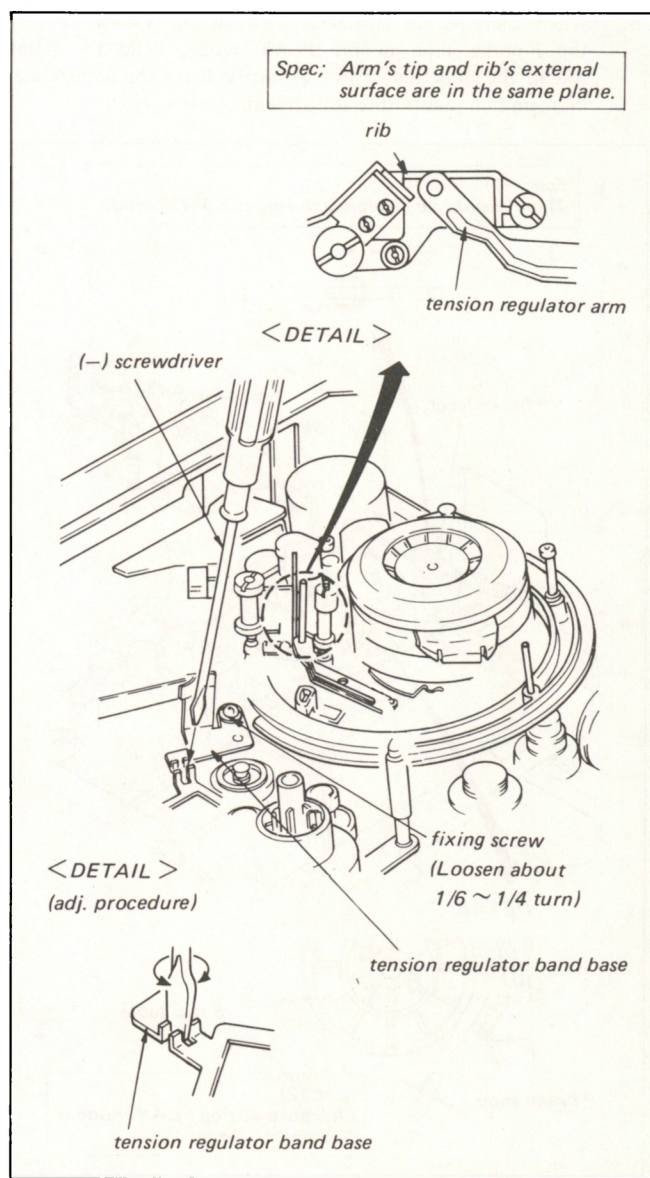


Fig. 6-13. Tension regulator arm position adj.  
(PLAY mode without a cassette)



## 6-8. PAUSE BRAKE CLEARANCE ADJUSTMENT

### (Check Procedure)

1. Stop the slack sensor function. (See section 2-4.)
2. Set up the STOP mode without a cassette. (See section 2-3.)
3. Confirm that there is a clearance between the P-link rod and the P-brake lever as shown in Fig. 6-14. If not, perform Step 5 for the adjustment.
4. Set up the PLAY mode and confirm that the P-brake shoe section satisfies the specification. If it does not, perform Step 6 for the adjustment.

### (Adjustment Procedure)

5. When there is no clearance between the P-link rod and the P-brake lever in the STOP mode, push the P-link rod in the direction shown by arrow A for making a clearance. Perform Step 4 again after this adjustment.
6. When there is no clearance between the P-link rod and the P-brake shoe in the PLAY mode, bend the P-link rod in the direction shown by arrow B for the adjustment. Perform Step 3 after the adjustment.

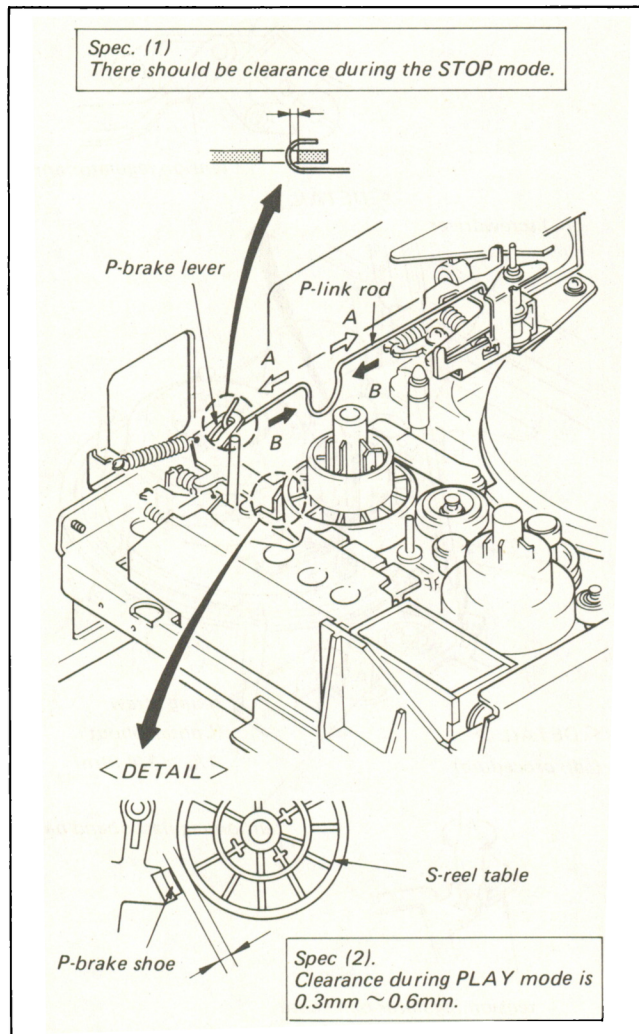


Fig. 6-14. Pause brake clearance adj.  
(STOP and PLAY modes without a cassette)



# SECTION 7

## BACK TENSION AND TORQUE ALIGNMENT

### 7-1. TAKE-UP TORQUE CHECK

- If the torque is below the specified value, the sufficient torque to take-up the tape at the tape end is not obtained, tape slack occurs at the capstan shaft, and the slack sensor tends to function.
- If the torque value is too much, the picture moves on the monitor screen in the STILL mode.
- The take-up torque has tendency to vary with the lapse of operation time.

#### [Check Procedure]

1. Install a prerecorded tape, press the REW button, and set up the PLAY mode after auto-stop. (Play back the very beginning of the tape of the cassette.)
2. Press the PAUSE button, setting up the STILL mode. Confirm that the guard band noise is stationary, not moving from the top to the bottom, on the monitor. When the guard band noise moves from the top to the bottom, perform the step 4 and its followings.
3. Press the F.FWD button, rewind the tape for a while, after the auto-stop at the tape end, then place the machine into the PLAY mode.

(Play back the very end of a tape of cassette.) Confirm that the slack does not occurs at the capstan shaft and the tape runs smoothly.  
If slack occurs, perform the adjustment described in step 4 and the following steps.

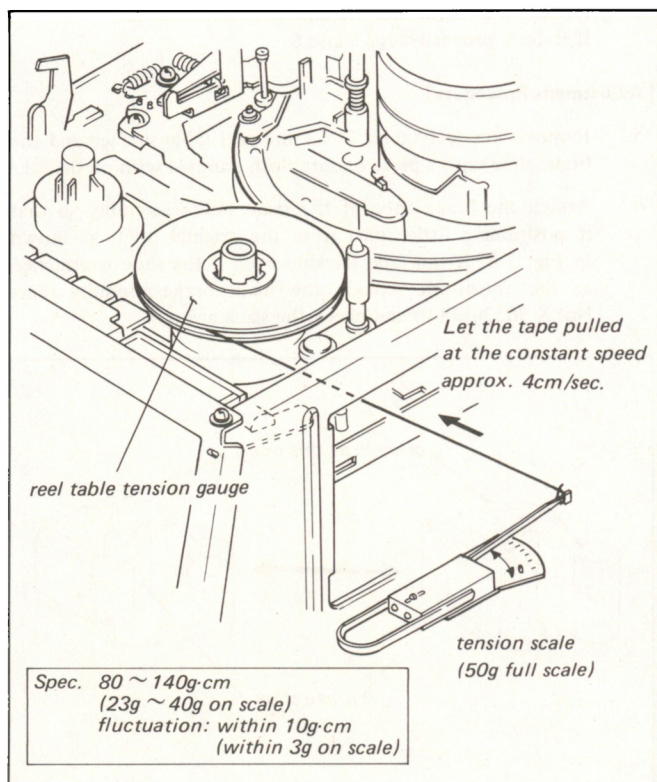


Fig. 7-1. Take-up torque check  
(Use reel table tension gauge in PLAY mode)

#### [Adjustment Procedure]

4. Remove the fixing screws of AU-7 and CR-5 boards and open the boards.
5. Clean the take-up reel table, FWD idler and belt with a cloth moistured by methanol.
6. Disable the slack sensor function. (See section 2-4.)
7. Wind the string of the reel table tension gauge (Jig Ref. No. J-5) counterclockwise (↺) around the gauge.
8. Place the reel table tension gauge onto the take-up reel table, withdraw the string about 30 cm, and attach the tension scale (50g full scale) (Jig Ref. No. J-7) to the end of the string.
9. Press the PLAY button to set up the PLAY mode.
10. Bring the tension scale toward the take-up reel table at a speed of about 4 cm/sec. and confirm the scale reading is within the specified value.  
If it is out of the specification, replace the FWD limiter assembly (Part No. X-3653-310-0) and confirm the scale reading again.

### 7-2. EJECT TORQUE CHECK

- The tape is taken up by the take-up reel table in the EJECT operation. The take-up reel table is rotated by the torque transmitted by the belt from the dc motor which makes the threading ring unthread in the gear box.
  - If the EJECT torque is below the specified value, only the threading ring starts unthreading in the EJECT mode while the tape is left in machine, so that scratches could be given to the tape.
1. Remove the fixing screws of AU-7 and CR-5 boards and open the boards.
  2. Clean the take-up reel table, EJECT idler, and belt with a cloth moistured by methanol.
  3. Wind the string of the reel table tension gauge (Jig Ref. No. J-5) counterclockwise (↺) around the gauge.
  4. Place the reel table tension gauge onto the take-up reel table. Withdraw the string about 30 cm, and attach it to the tension gauge (50g full scale) (Jig Ref. No. J-7).
  5. Press the EJECT button to set up the EJECT mode. (See section 2-3.)
  6. Bring the tension gauge toward the take-up reel table at a speed of about 4 cm/sec. in the unthreading operation as shown in Fig. 7-2. Confirm that the gauge reading is within the specified value.  
If it is out of the specification, replace the EJECT limiter assembly (Part No. X-3653-328-0) of the gear box section and confirm the value again.



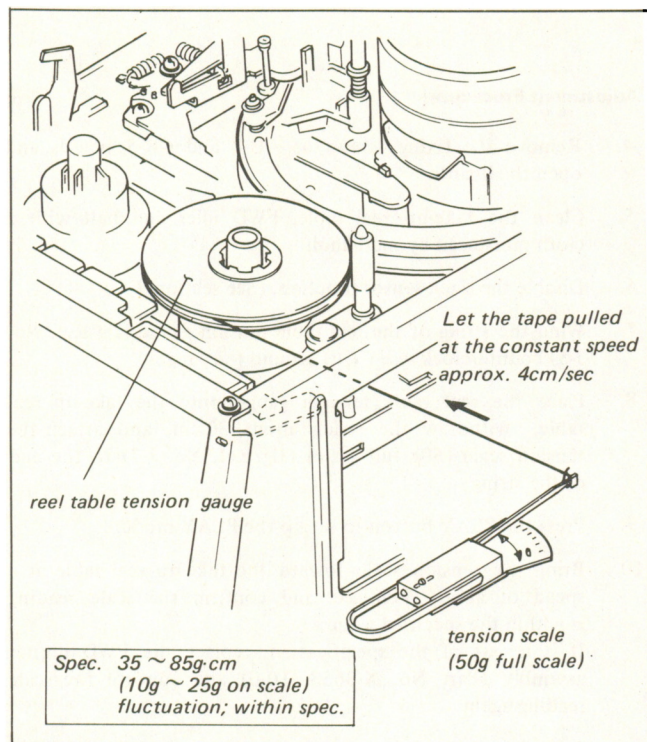


Fig. 7-2. Eject torque check  
(Use reel table tension gauge in EJECT mode)

### 7-3. BRAKE TORQUE CHECK

This machine has brakes such as the supply reel main brake, take-up reel main brake, pause brake and take-up pause brake. Operations of these brakes are listed up below.

| Reel table Mode                | Supply reel table                                                                                                                | Take-up reel table                                                                                               |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Cassette-up (EJECT completion) | Main and PAUSE brakes are ON.                                                                                                    | Only main brake is ON.                                                                                           |
| During Threading               | Only PAUSE brake is ON.<br>(OK even supply reel turns a little)<br>Pause brake torque<br>CW (↻) reel table rotation; 10 ~ 20g.cm | Free<br>(Take-up reel supplies the tape.)                                                                        |
| During STOP                    | Main and PAUSE Brakes are ON.<br>CW (↻) reel table rotation; 100 ~ 300g.cm<br>CCW (↺) reel table rotation; 40 ~ 120g.cm          | Only main brake is ON.<br>CW (↻) reel table rotation; 40 ~ 120g.cm<br>CCW (↺) reel table rotation; 100 ~ 300g.cm |
| During F.F                     | Only PAUSE brake is ON.                                                                                                          | Free<br>(Takes up tape onto take-up side)                                                                        |
| During REW                     | Only PAUSE brake is ON.<br>(Takes up tape onto supply side.)                                                                     | Free                                                                                                             |

|              |                                                                  |                                            |
|--------------|------------------------------------------------------------------|--------------------------------------------|
| During PLAY  | Only FWD back tension brake band is ON.                          | Free<br>(Takes up tape onto take-up side.) |
| During PAUSE | PAUSE brake and FWD back tension brake band are ON.              | Only take-up pause brake is ON.            |
| Unthreading  | Only PAUSE brake is ON.<br>(OK even supply reel turns a little.) | Free<br>(Takes up tape onto take-up side.) |

#### 7-3-1. Main Brake Operation Check

- If slack occurs when mode is changed from FAST FWD to STOP or from REWIND to STOP mode, perform the check and the adjustment by the following procedures.
- The slack tends to occur when the tape diameter on the take-up side is small, perform the check in such a condition.

##### [Check Procedure]

1. Install a cassette. Rewind all the tape and stop at the beginning of tape.
2. Repeat the FAST FWD and then STOP operation two or three times and confirm that the tape does not slacken. If it does, proceed steps 5 and 6.
3. Set up the state that most of the tape is taken up. (Perform the FAST FWD until the tape end is obtained.)
4. Repeat the REW and then STOP operation two or three times and confirm that the tape does not slackens. If it does, proceed steps 5 and 6.

##### [Adjustment Procedure]

5. Remove the reel table. Clean the reel table surface and the brake shoe with a piece of soft cloth dampened with methanol.
6. Attach the brake shoe of the main brake assembly so that it positions a little apart from the original point as shown in Fig. 7-3. If the tape slackens even if the shoe is attached at that position, replace the main brake assembly (Part No. X-3653-338-0) and check the slack again.

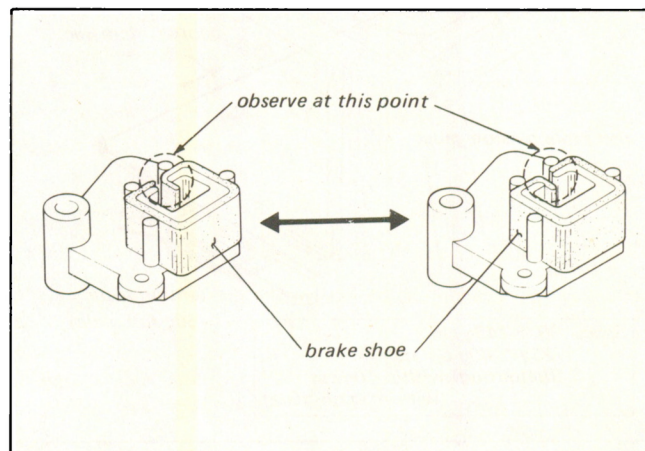


Fig. 7-3. Main brake torque check



(Reference)

- Follow the below procedures for the main brake torque measurement.
  - (i) Set up the STOP mode with a cassette.
  - (ii) Place the reel table tension gauge (Jig Ref. No. J-5) onto the reel table, hook its string on the tension scale (100g full scale) (Jig Ref. No. J-8) and pull the scale at a speed of about 4 cm/sec. Read the scale value.

(Specification)

- When the supply reel table is turned CW ( ↻ );  
100g·cm to 300g·cm (28g to 85g on scale)
- When the supply reel table is turned CCW ( ↺ );  
40g·cm to 120g·cm (11g to 34g on scale)
- When the take-up reel table is turned CW ( ↻ );  
40g·cm to 120g·cm (11g to 34g on scale)
- When the take-up reel table is turned CCW ( ↺ );  
100g·cm to 300g·cm (28g to 85g on scale)

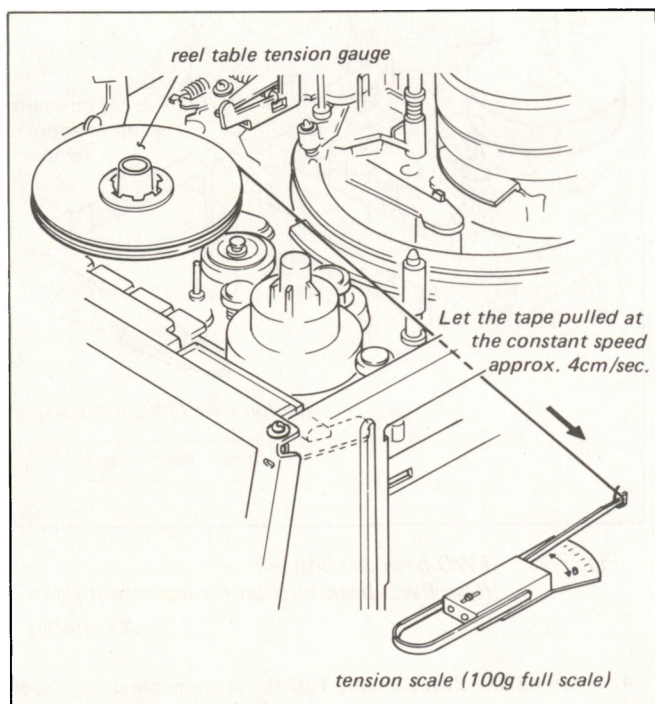


Fig. 7-4. Main brake operation check  
(Use reel table tension gauge in STOP mode)

### 7-3-2. Pause Brake Torque Check

- In the machine's PAUSE mode the pause brake and the FWD back tension brake band are applied on the supply reel table. Here in this section, the pause brake torque is checked in the state where only the pause brake is applied (during threading, during FF, during REW and during Unthreading modes).

- If the guard band noise moves from top to bottom of the monitor picture in the STILL mode, causes of trouble are (i) Take-up torque, (ii) Pause brake torque, (iii) FWD back tension, and (iv) Take-up pause brake torque. Check not only pause brake but also others.

[Check Procedure]

1. Install a prerecorded cassette. Rewind the tape fully and play back the beginning of a tape.
2. Confirm that the guard band noise does not move from top to bottom of the picture in the STILL mode. If it does, perform the adjustment according to step 3 and following steps.

[Adjustment Procedure]

3. Clean the contacting face of the supply reel table to the brake shoe with a piece of soft cloth moistured with methanol.
4. Set up the STOP mode.
5. Wind the string of the reel table tension gauge (Jig Ref. No. J-5) clockwise ( ↻ ) around the gauge.
6. Set the gauge on the supply reel table and hook the string on the tension scale (50g full scale) (Jig Ref. No. J-7).
7. Set up the FF mode. Pull the tension scale at a speed of about 4cm/sec. and confirm the reading.

If the reading is outside the specification, stretch or cut the tension spring of the pause brake ass'y, or replace the pause brake ass'y (PART No. X-3653-339-4).

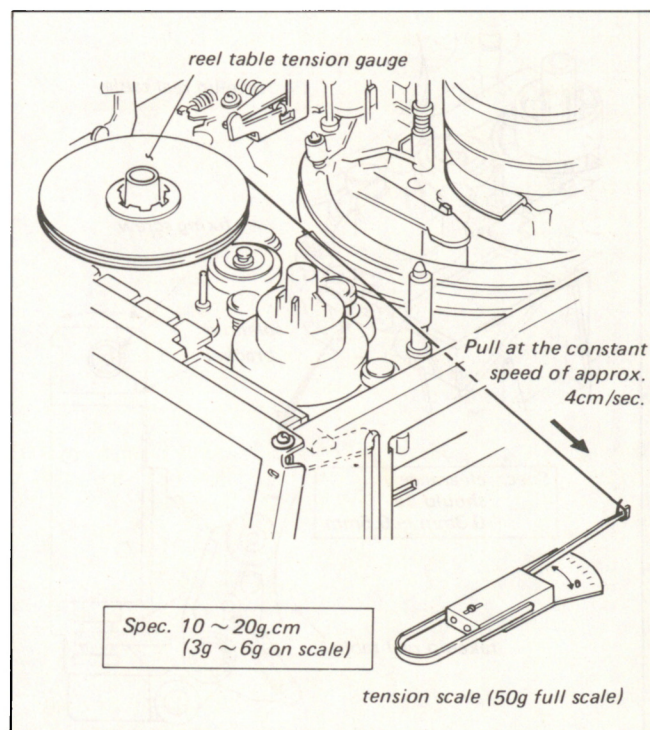


Fig. 7-5. Pause brake torque check  
(Use reel table tension gauge in FF mode)



### 7-3-3. Take-up Pause Brake Check

- If the guard band noise moves from top to bottom of the monitor picture in the STILL mode, cause of trouble are below.
  - insufficient take-up pause brake effect
  - big take-up torque
  - small pause brake torque
  - small FWD back tension
- If the symptom is observed, check and adjust in the sequence of following procedures.

#### [Check Procedure]

1. Install the alignment tape (KR5-1) (Jig Ref. No. J-12). Rewind the tape fully and play back the tape beginning.
2. Check that the guard band noise does not move in the STILL mode.  
When the guard band noise moves, adjust as follows.

#### [Adjustment Procedure]

3. Check that there is a clearance shown in Fig. 7-6 in the take-up pause brake. If not, adjust the position of the solenoid bracket.
4. Perform the check stated in step 2. If the noise moves, proceed to step 5.
5. Adjust the FWD back tension and the pause brake torque for a large value within the specified values and check the take-up torque.

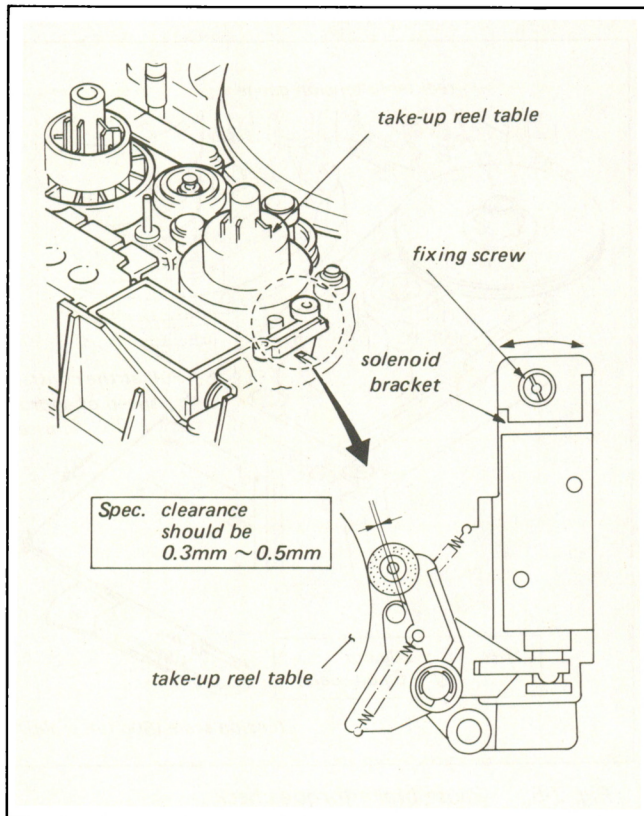


Fig. 7-6. Take-up pause brake check (PAUSE mode with a cassette)

### 7-4. FWD BACK TENSION ADJUSTMENT

- The measurement of the FWD back tension in this section is simplified measurement though the ideal measurement is to measure it in the state identical to the state that the tape is actually running. The difference in the measured values in the simplified and ideal ones are corrected in the specified value.
1. Remove the fixing screws of AU-7 and CR-5 boards and open the boards.
  2. Set up the STOP mode without the cassette. (See section 2-3.)
  3. Place the FWD back tension measurement jig (Jig Ref. No. J-6) onto the supply reel table and thread the tape as shown in Fig. 7-7. Attach the tension gauge (100g full scale) (Jig Ref. No. J-8) to the tape top.

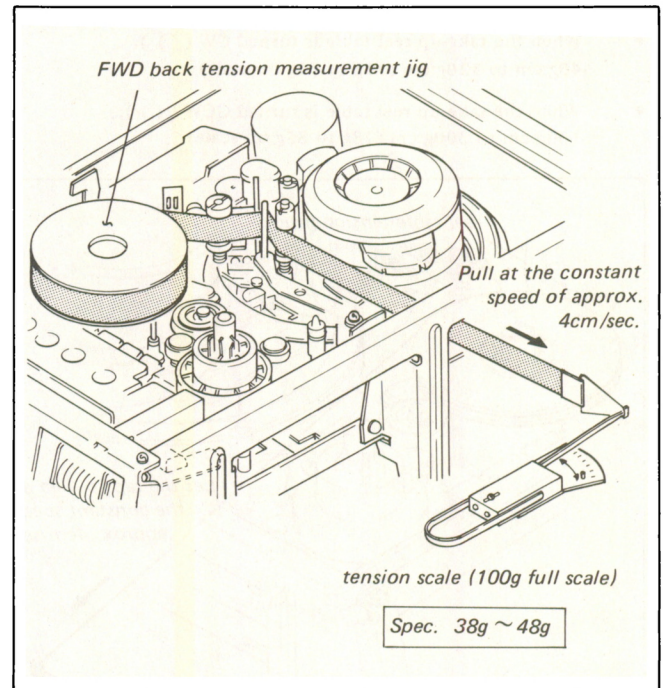


Fig. 7-7. FWD back tension adj.  
(Use FWD back tension measurement jig in PLAY mode)

4. Set up the PLAY mode. Pull the tension gauge at a speed of about 4 cm/sec. in the direction shown in Fig. 7-7. Confirm the reading is within the specification. If not, adjust as follows.
5. Change the position of the tension regulator arm spring for the adjustment. It is designed that one notch corresponds to 5g change.

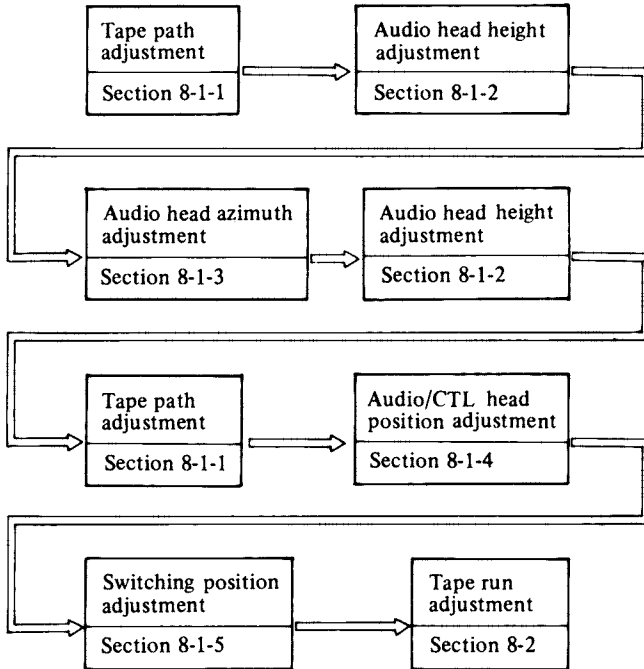


# SECTION 8

## TAPE RUN ALIGNMENT

### 8-1. TRACKING ADJUSTMENT

#### Adjustment Sequence



#### (Preparation)

##### 1. Jig and tool required

Alignment tape (KR5-1) (Jig Ref. No. J-12)  
 Reference flat plat (Jig Ref. No. J-9)  
 Dual trace oscilloscope  
 Inspection mirror (Jig Ref. No. J-10)  
 Methanol (Jig Ref. No. J-13)  
 Chamois (Jig Ref. No. J-14)  
 (-) 3mm screwdriver  
 1.25mm edge length Allen-type wrench

##### 2. Connection of oscilloscope

RF envelop waveform; TP-3/VY-1 board

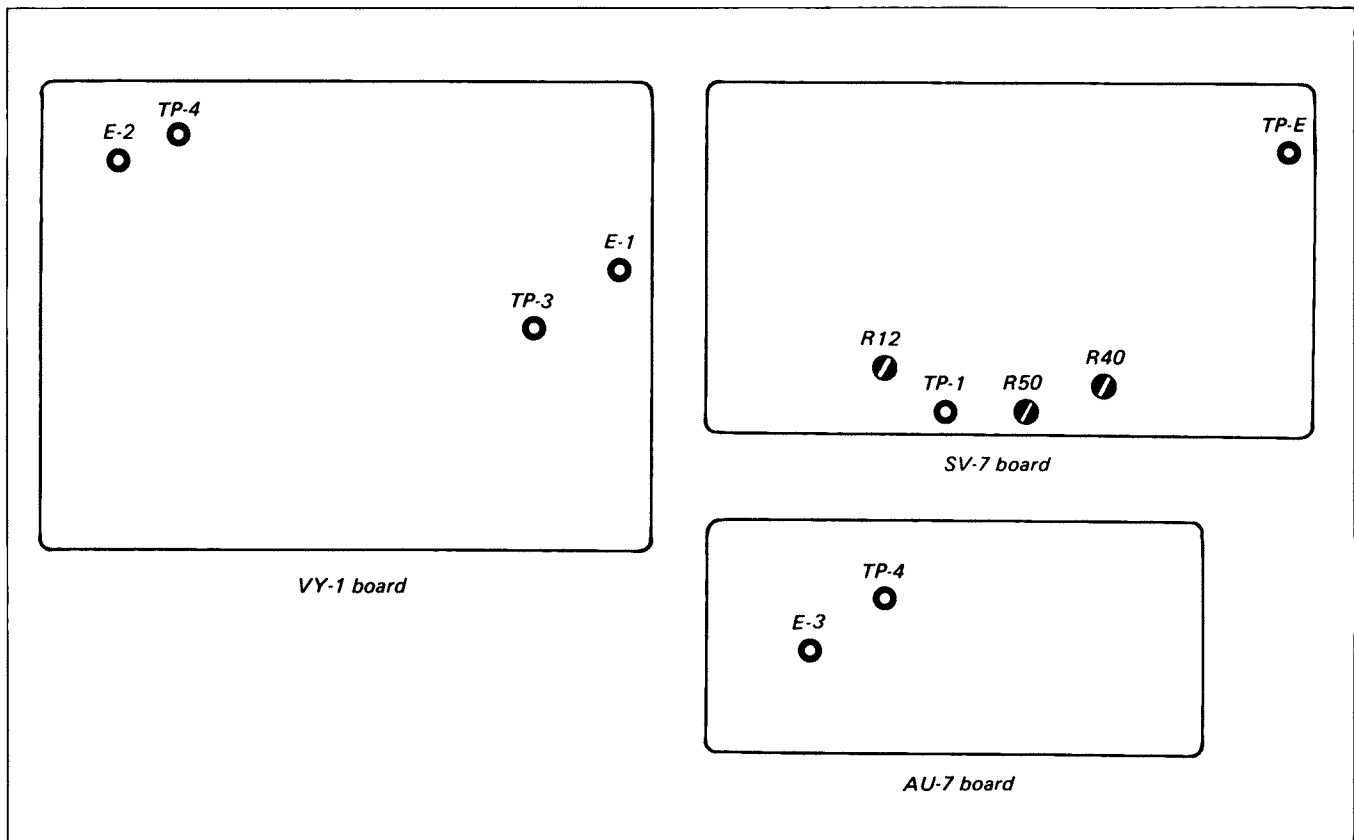
(The oscilloscope cannot be connected to TP-3 because the board is mounted on the bottom of the machine. Solder a shielded cable of about 15 cm (6") long to the point temporarily and connect the scope to end of cable.)

External trigger; TP-1/SV-7 board

AUDIO OUT; TP-4/AU-7 board

VIDEO OUT; TP-4/VY-1 board

Switching waveform; TP-1/SV-7 board



TAPE RUN

Fig. 8-1.



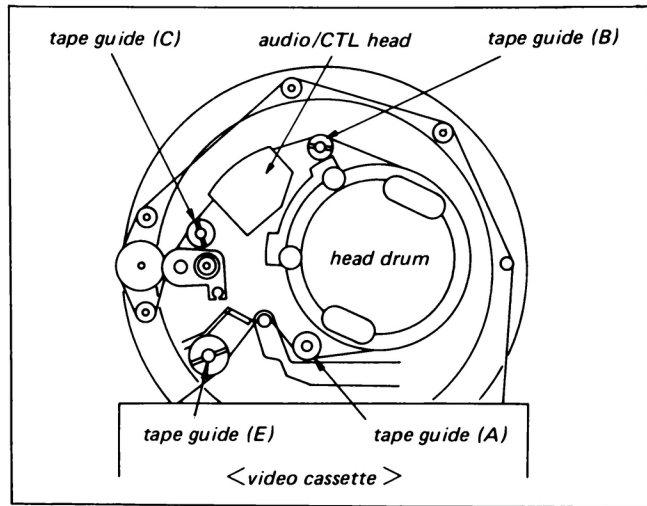


Fig. 8-2. Location of tape guide

### 8-1-1. Tape Path Adjustment

Perform this adjustment with utmost care because it has much influence on tape interchangeability and picture quality.

#### (Check Procedure)

1. Clean tape running path (such as tape guide, drum, capstan, pinch roller and others) with a chamois moistened with methanol.
2. Connect the oscilloscope to TP-3/VY-1 board with external trigger to TP-1/SV-7 board.
3. Play back the color-bar or the monoscope signal segment of the alignment tape (KR5-1).
4. Confirm that the RF output waveform on the oscilloscope increases and decreases as it maintains flatness when the tracking control is turned in the both directions from the center detent position. If it does not keep flatness, perform Step 6 for the adjustment.
5. Confirm that the RF output waveform displayed on the scope meets the specification required shown in Fig. 8-3 when it is made to maximum by turning the tracking control. If it does not, proceed to Step 6.

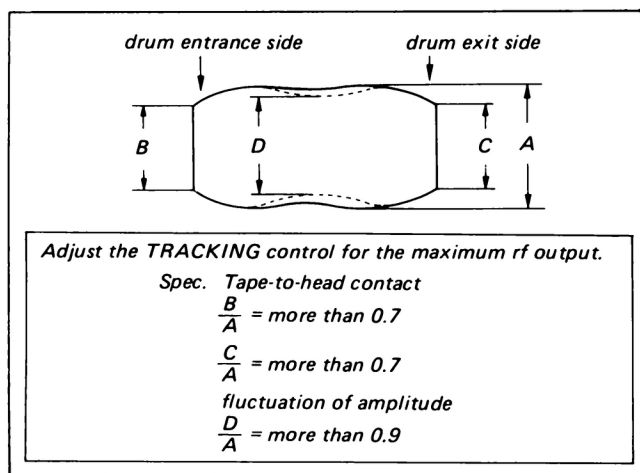


Fig. 8-3. Tape path adj.  
(PLAY mode, playing back KR5-1)

#### (Adjustment Procedure)

6. Adjust the height of the tape guide (A) when the waveform at the drum entrance side is not flat when turning the tracking control, as shown in Fig. 8-4. When the waveform at the drum exit side is not flat, adjust the height of each of the tape guides (B) and (C) so that the tape contacts the lowest groove of the drum, that no tape curl occurs around the flange of each tape guide, that the tape touches the upper or lower flange as shown in Fig. 8-5, and that the RF output waveform is flat.

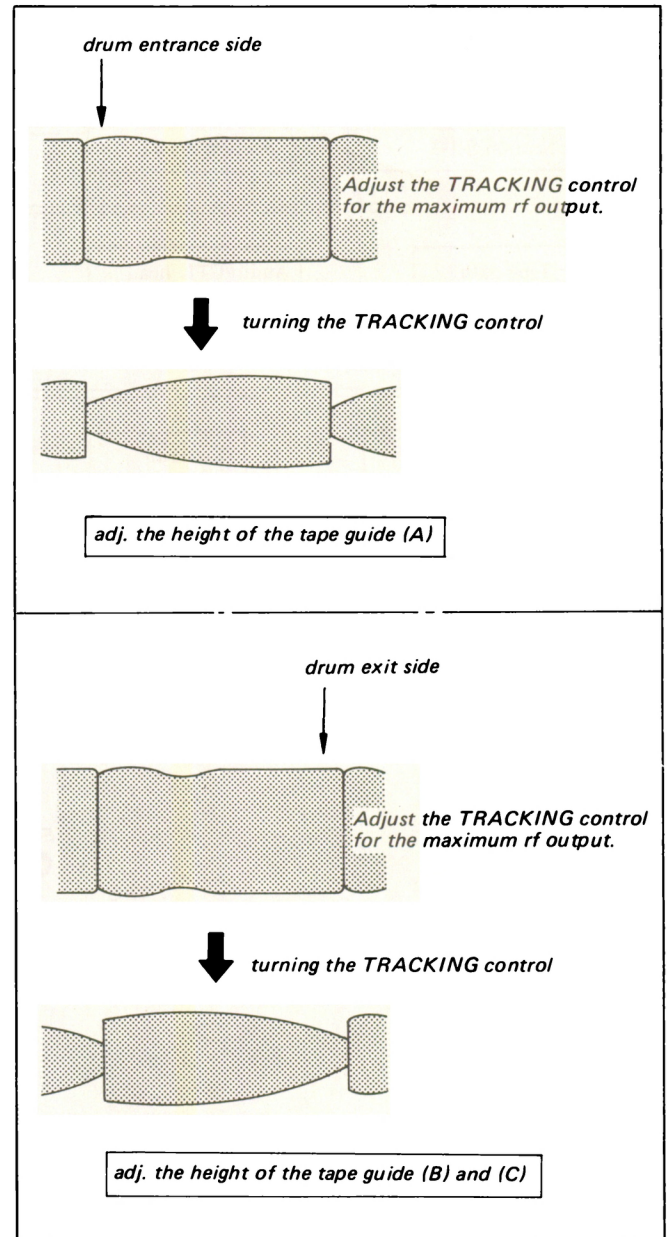
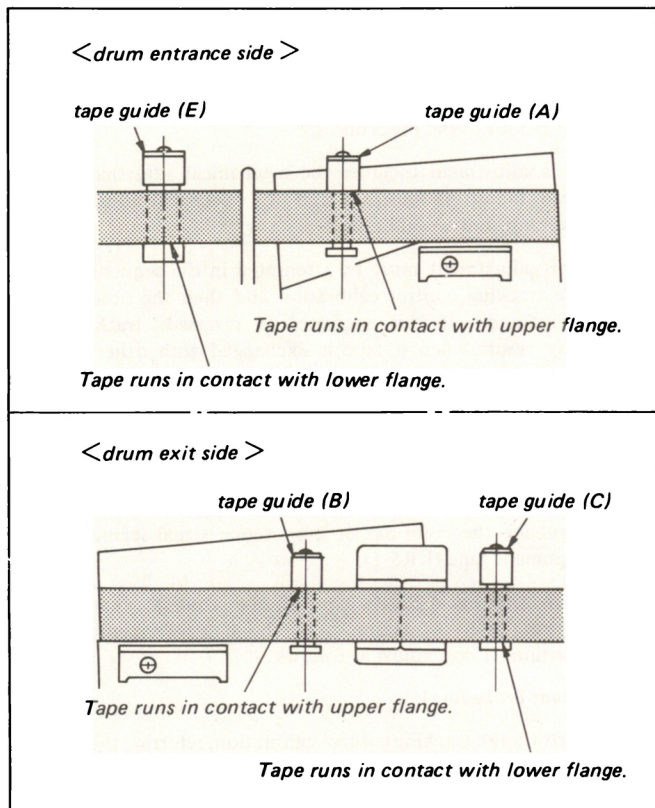


Fig. 8-4. Tape path adj.  
(PLAY mode, playing back KR5-1)





**Fig. 8-5. Tape path adj.**  
(PLAY mode, playing back KR5-1)

**Note:** The height of the tape guide (E) is not normally adjusted because its height is utilized as reference. But if it has been replaced, adjust the height of the tape guide (E) first in reference to the height of the tape guide (A).

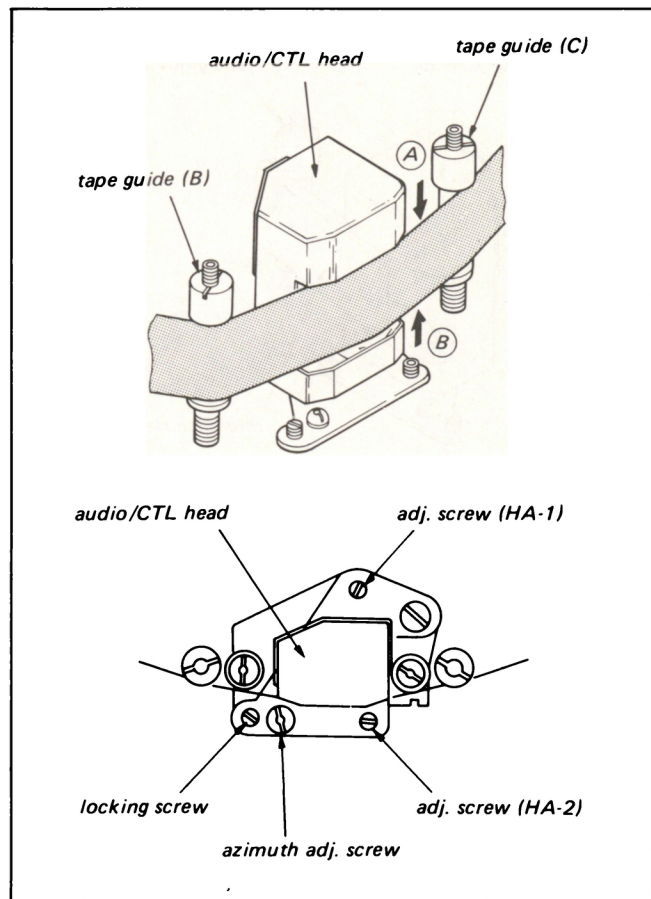
7. If hue shift is observed at top of the monitor screen when playing back the color-bar segment of the alignment tape, adjust slantness of the audio/CTL head within the allowable range shown in Fig. 8-7.

### 8-1-2. Audio Head Height Adjustment

The audio head section requires three adjustments of the height, azimuth, and slantness. These three adjustments have close relationship. If one of the adjustments is done, perform the rest two adjustments without fail.

#### (Check Procedure)

1. Connect the oscilloscope (or VTVM) to TP-4/AU-7 board.
2. Play back the audio 3 kHz segment (color-bar signal section) of the alignment tape (KR5-1).
3. Confirm that the level variation is not more than 1 dB when the (A) section of the tape is pressed slightly with the finger as shown in Fig. 8-6.  
If not, perform Step 6 for the adjustment.
4. Confirm that level does not increase more than 1 dB when the (B) section of the tape is pushed up slightly as shown in Fig. 8-6.  
If not, perform Step 7 for the adjustment.



**Fig. 8-6. Audio head height adj.**  
(PLAY mode, playing back KR5-1)

#### (Adjustment Procedure)

5. When the level increases more than the specification when the (A) section is pushed downward, adjust as follows.
  - (i) Loosen the locking screw and turn the two adjusting screws (HA-1 and HA-2) clockwise (↻) by the same turning angle. (Perform check every 30° turn and then adjust finely.)
  - (ii) Adjust the azimuth adjusting screw for maximum waveform (about 0 dB). (Tentative azimuth adjustment)
  - (iii) Set the reference flat plate (Jig Ref. No. J-9) upon the tape guide (C) and the audio head as shown in Fig. 8-7. Adjust the adjusting screws (HA-1 & HA-2) and the azimuth adjusting screw for no clearance among the reference flat plate, the tape guide and the head. (Slantness adjustment)
  - (iv) Confirm the audio head height by Steps 3 and 4. Then tighten the locking screw.
6. When the level increases more than the specification when the (B) section is pushed up, adjust as follows.
  - (i) Loosen the locking screw and turn the two adjusting screws (HA-1 & HA-2) counterclockwise (↺) by the same turning angle. (Perform check every 30° turn and then adjust finely.)
  - (ii) Perform the adjustment by Steps 6-(ii), (iii), (iv).



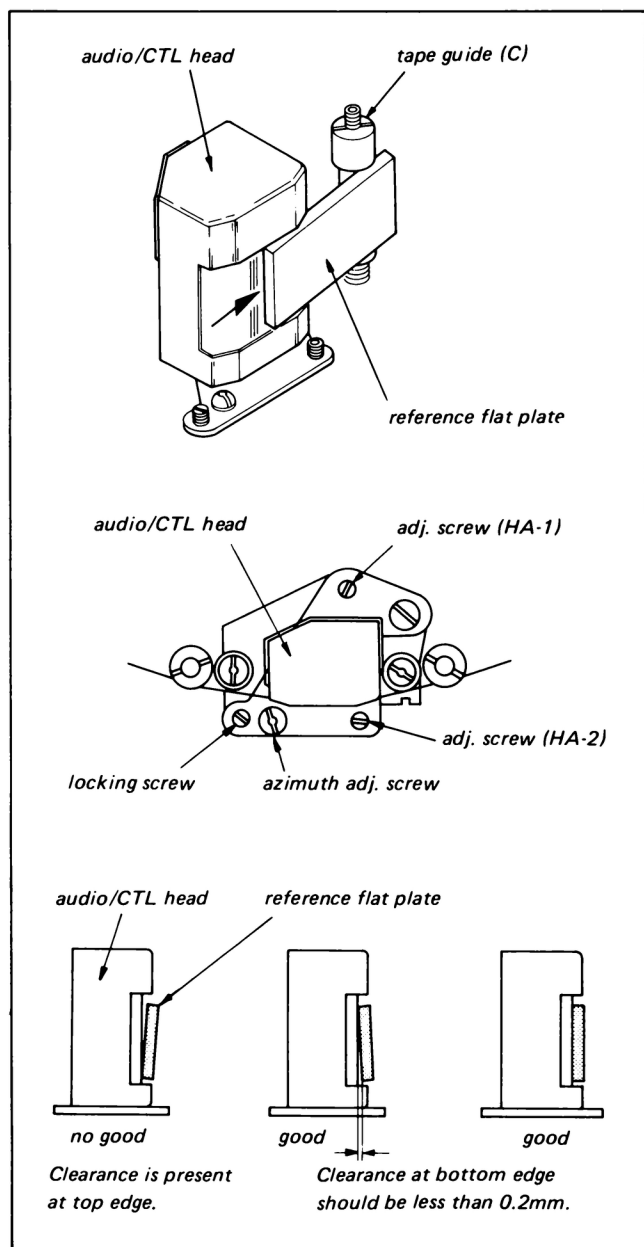


Fig. 8-7. Audio head height adj; Slantness adj.

7. Perform Section 8-1-3 "Audio azimuth adjustment" and Section 8-1-1 "Tape path adjustment".

### 8-1-3. Audio Head Azimuth Adjustment

1. Connect the oscilloscope (or VTVM) to TP-4/AU-7 board.
2. Play back the audio 7 kHz segment (monoscope signal section) of the alignment tape (KR5-1).
3. Loosen the locking screw shown in Fig. 8-6. Adjust the azimuth adjusting screw for maximum level (about -20 dB) and tighten the screw.
4. Confirm the audio head height by the procedure of Section 8-1-2 "Audio head height adjustment" after this azimuth adjustment is complete.

### 8-1-4. Audio/CTL Head Position Adjustment

- The adjustment of the audio/CTL head position to this model is different from that of the playback-only-machine (SLP-300) in the procedures.
- This adjustment includes the mechanical adjustment of the head mounting position and the electrical adjustment of tracking control calibration.
- This adjustment must be attempted in the sequence of first the tracking control calibration and then the head position adjustment. If this sequence is reversed, tracking error may result when a tape is exchanged with other Betamax machines.

#### [Check Procedure]

1. Connect the oscilloscope to TP-3 on the VY-1 board with external trigger from TP-1/SV-7 board.
2. Playback the color-bar or monoscope signal segment of the alignment tape (KR5-1).
3. Turn the TRACKING control and confirm that the RF output level is maximum at the control's center detent position. If not, adjust as follows.

#### [Adjustment Procedure]

4. Perform the tracking control calibration, referring the electrical adjustment section.
5. Adjust audio/CTL head position with a (-) screwdriver as shown in Fig. 8-8 so that the playback RF output level of the color-bar or monoscope signal of the alignment tape (KR5-1) is maximum when the TRACKING control is in the FIX position.

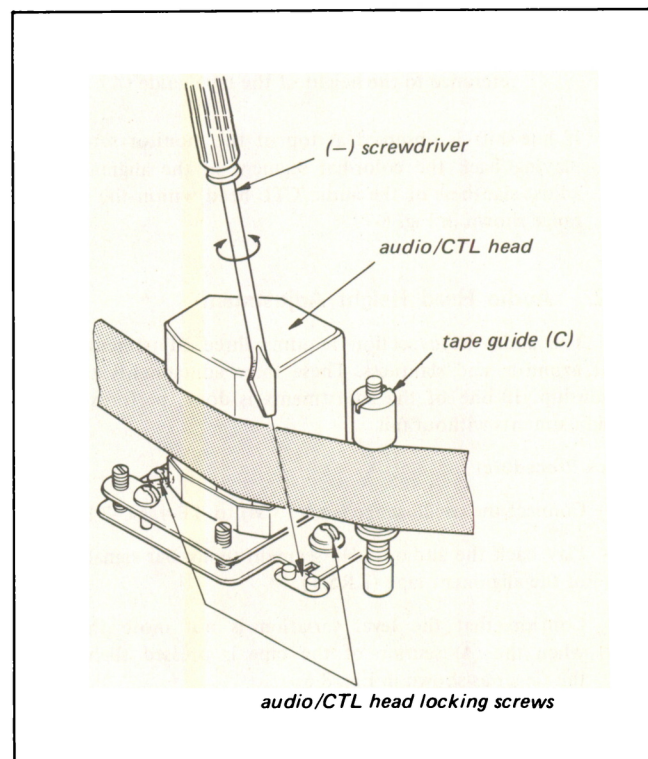


Fig. 8-8. Audio/CTL head position adj.  
(PLAY mode, playing back KR5-1)



## 8-1-5. Switching Position Adjustment

### (Check Procedure)

1. Connect the dual trace oscilloscope to TP-1/SV-7 board and VIDEO OUT connect, with external trigger to TP-1/SV-7 board.
2. Play back the alignment tape (KR5-1) and confirm that the specification is satisfied.  
If not, perform Step 4 for the adjustment.
3. Observe the monitor picture and confirm that the switching pulse shown in Fig. 8-9 are not two but only one observed at the lower section of the picture.

(The switching position adjustment is sufficient if the specification is satisfied in Step 2 but if adjustment is necessary perform Step 5.)

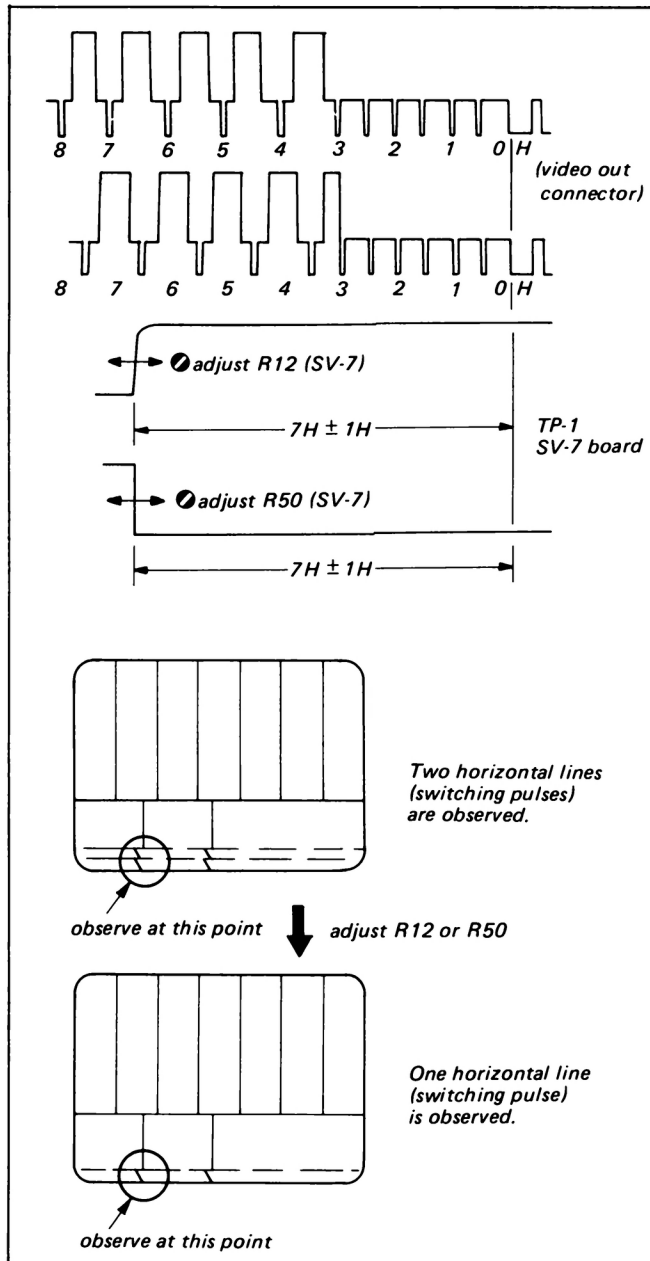


Fig. 8-9. Switching position adj.  
(PLAY mode, playing back KR5-1)

### (Adjustment Procedure)

4. Adjust R12 and R50 on the SV-7 board shown in Fig. 8-9 for the specification.
5. Adjust R12 or R50 so that the switching position of the CH-A is identical with that of the CH-B.

## 8-2. TAPE RUN ADJUSTMENT

If this adjustment is poorly performed, the take-up reel makes scratches on the tape edge in the PLAY and FF modes, tape run at the audio/CTL head becomes unstable in the FF and REW modes, the CTL signal becomes impossible to be played back and the machines such as RM-300 will malfunction.

### (Check Procedure)

1. Playback the alignment tape (KR5-1) (Jig Ref. No. J-12).
2. Confirm with using the inspection mirror (Jig Ref. No. J-10) that the take-up side tape guide has the specified positional relationship with the tape inside the cassette as shown in Fig. 8-10.  
If not, perform Step 5.

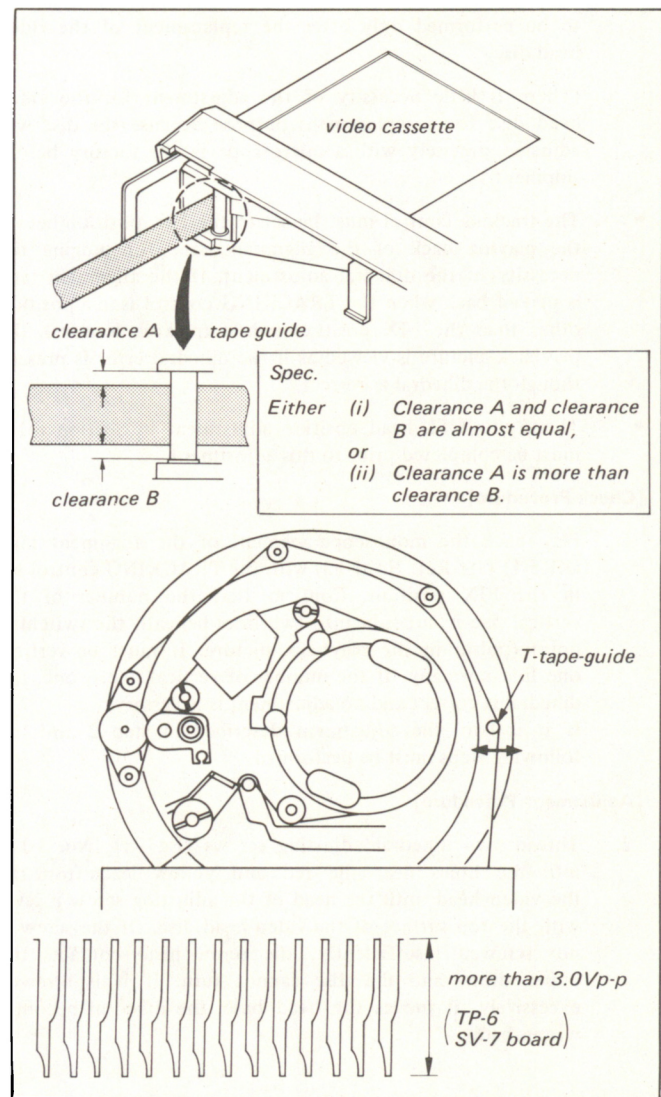


Fig. 8-10. Tape run adj.  
(PLAY mode, playing back KR5-1)



3. Check to see that any noise produced by contacting tape with reel hub inside cassette is not heard during PLAY mode. If noise is heard, adjust by step 5.
4. Confirm that the output level of the CTL signal at TP-6 on the SV-7 board meets the specification in the REW mode. If not, perform Step 5.

**(Adjustment Procedure)**

5. Bend the T-tape-guide shaft shown in Fig. 8-10 in the direction shown by the arrow for obtaining the specifications in Steps 2, 3, and 4.

**Note:** Be careful not to break the T-tape-guide shaft by repetition of bending. Its lower section is easily bent for the adjustment and sometimes it breaks if it is bent excessively or too many times.

### 8-3. VIDEO HEAD DIHEDRAL ADJUSTMENT

- Normally this adjustment is not necessary. It is required to be performed only after the replacement of the video head disc.

(There is little necessity of the adjustment for the video head disc for a replacement purpose because the disc was adjusted precisely with a microscope in the factory before shipment.)

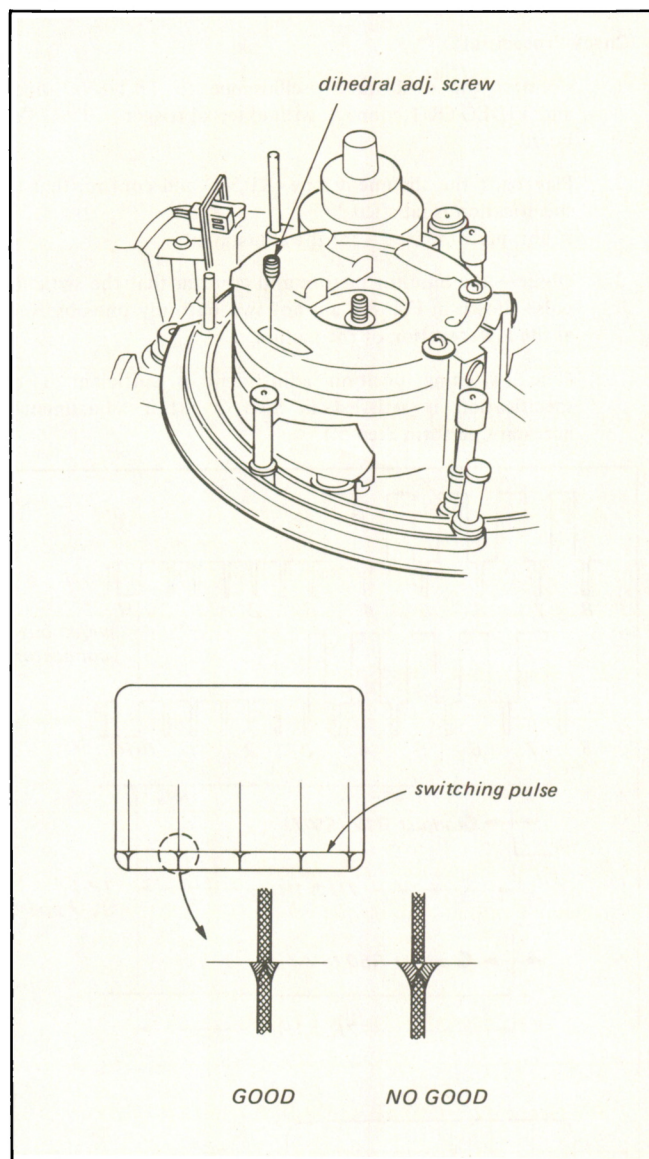
- The tracking control must be set to the FIX position before the playing back of the alignment tape for judging the necessity of the dihedral adjustment. If the alignment tape is played back when the TRACKING control is in a position other than the FIX position (when tracking loosens), the playback picture is viewed as if the dihedral error is present though the dihedral is correct.
- The Audio/CTL head position adjustment in Section 8-1-4 must be completed prior to this adjustment.

**[Check Procedure]**

1. Play back the monoscope segment of the alignment tape (KR5-1) (Jig Ref. No. J-12) with the TRACKING control set in the FIX position. Confirm that the number of the vertical line is not split into two lines beneath the switching point (pulse) in the playback picture. It must be vertical one line normally. If the number of vertical line is one, the dihedral is correct and no adjustment is necessary. If it is two, the adjustment described in step 2 and the following steps must be performed.

**[Adjustment Procedure]**

2. Thread two dihedral adjusting screws (Jig Ref. No. J-11) into the holes near the red and yellow leads from the the video head until the head of the adjusting screw is level with the top surface of the video head disc. (If the screw is not screwed insufficiently, the screw head contacts the upper drum and the disc cannot turn. If it is screwed excessively, it moves the head base, the dihedral becomes wrong badly.)



**Fig. 8-11. Video head dihedral adj.  
(PLAY mode, playing back KR5-1)**

3. Tighten the one of the adjusting screws further until it becomes hard a little, to screw it. If the screw is tightened further, the video head moves and the dihedral can be adjusted.
4. Playback the monoscope signal segment of the alignment tape (KR5-1) with the adjusting screws threaded and check the playback picture.

If the dihedral of the vertical line becomes larger than the one before the adjustment, loosen the screw which has been tighten by turning counterclockwise and tighten the adjusting screw on the opposite side, for adjustment.

5. After the completion of the adjustment, remove the adjusting screws and check the picture again.



# SECTION 9

## ELECTRICAL ALIGNMENT

### 9-1. POWER SUPPLY ALIGNMENT

Equipment; DC Voltage Meter or VOM  
VTR; Stop Mode

#### 9-1-1. Regulated 12V Adjustment

PW-17 board TP-1 (GND; E-1) =  $12.0 \pm 0.2Vdc$   
R5

#### 9-1-2. Unregulated 12V Check

PW-17 board CN3-pin10 (GND; E-1) =  $22.0 \pm 4Vdc$   
(on the conditions that the ac 120V sharp  
is supplied from ac power line)

#### 9-1-3. Regulated 13V Check

PW-17 board Q7-collector (GND; E-1) =  $13.5 \pm 0.5Vdc$

#### 9-1-4. RFU Regulated 12V Check

**Note:** Confirm that the RF unit is installed in the machine. If not, temporarily solder a resistor of 150 ~ 240 ohms (more than 1W) across CN3-pin12 on the PW-17 board and GND as an equivalent load to RF unit.

PW-17 board CN3-pin12 (GND; E-1) =  $12.0 \pm 0.5Vdc$

#### 9-1-5. SYS 12V Check

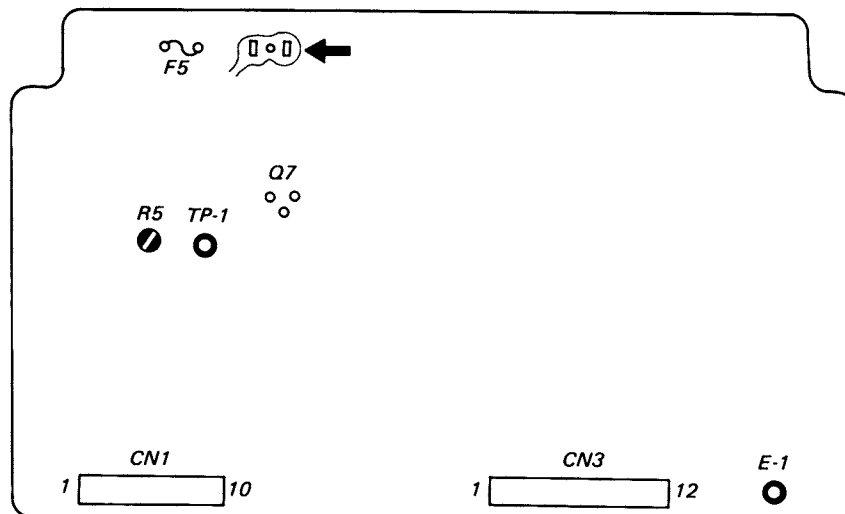
PW-17 board CN3-pin8 (GND; E-1) =  $12.0 \pm 0.5Vdc$

#### 9-1-6. Regulated 6.5V Check

PW-17 board CN1-pin6 (GND; E-1) =  $6.5 \pm 0.5Vdc$   
equiv; the  in the figure below.

#### 9-1-7. Regulated 5V Check

PW-17 board CN1-pin2 (GND; E-1) =  $5.0 \pm 0.5Vdc$   
equiv; SY-30 board CN1-pin8, 9, 10



PW-17 board (soldering side)



## 9-2. SYSTEM CONTROL ALIGNMENT

### 9-2-1. Supply (Tape End) Sensor Osc. Level Adjustment

Equipment; Oscilloscope

Horiz;  $1\mu\text{sec}/\text{DIV}$

VTR;

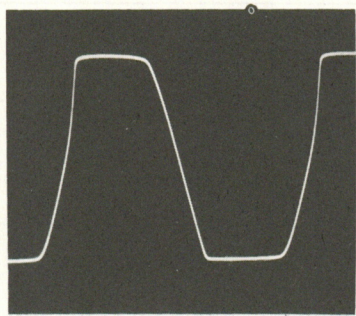
1. Mode; Stop or Completion of Eject
2. Place the machine in the vertical position with its power transformer on its bottom.
3. SY-24 board TP-2 – TP-3; shorted

Spec. & Adj.

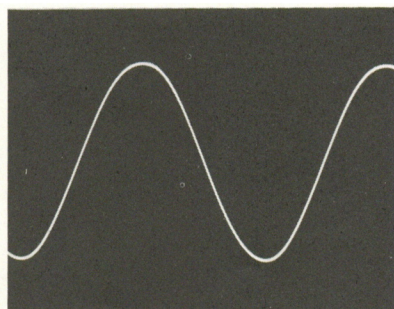
SY-24 board

TP-2 (GND; E-1)

Ⓡ104 Ⓢ; fully



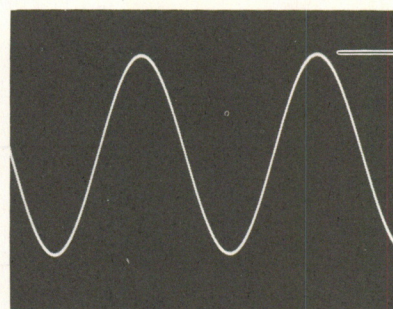
Ⓡ104 Ⓢ slowly, until the no-clipped wave.



Spec. & Adj.

SY-24 board

TP-1 (GND; E-1)



$4.0 \pm 0.5V$   
Ⓡ86

TP-2 TP-3

Ⓡ104

E-1

Ⓡ86

TP-1

SY-24 board (soldering side)

### 9-2-2. Take-up (Tape Beginning) Sensor Osc. Level Adjustment

Equipment; Oscilloscope

Horiz;  $1\mu\text{sec}/\text{DIV}$

VTR;

1. Mode; Rewind
2. Place the machine in the vertical position with its power transformer on its bottom.



### 9-3. SERVO SYSTEM ALIGNMENT

Alignment Tape; KR5-1 Part No. 8-969-995-01

| Counter | Time | Video         | Audio      |
|---------|------|---------------|------------|
| 000-100 | 5min | —             | —          |
| 100-280 | 10   | 75% Color-bar | 3kHz —5dB  |
| 280-430 | 10   | Monoscope     | 7kHz —25dB |
| 430-560 | 10   | RF Sweep      | 333Hz —5dB |
| 560-870 |      | —             | —          |

**CAUTION;** Don't use alignment tape KR5-1L and KR5-1D that are for Betamax-X2.

#### 9-3-1. Drum Free Speed Adjustment

**Equipment;** Oscilloscope or DC Voltgometer or VOM  
**VTR;** Mode; Playback of Alignment Tape  
 (any segment)

**Spec & Adj.**

SV-7 board TP-4 (GND; TP-E) =  $5.5 \pm 0.2Vdc$   
 R28

#### 9-3-2. Capstan Free Speed & Capstan Response Adjustment

**Equipment;** Oscilloscope  
**Mode; DC**  
**VTR;** 1. Mode; Record  
 2. Video Input; Ordinary Color Video Signal

**Spec & Adj.**

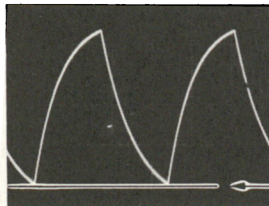
SV-7 board

TP-7 (GND; TP-E) =  $5.5 \pm 0.2Vdc$   
 R86



Repeat the adjustments.

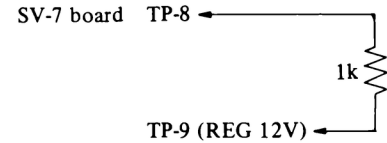
IC4-pin20  
 (GND; TP-E)  
 R128



$2.0 \pm 0.2Vdc$

#### 9-3-3. Tape Speed Adjustment

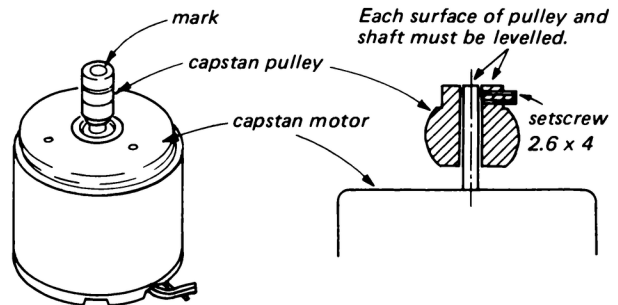
**Equipment;** Frequency Counter  
**VTR;** 1. Mode; Playback of Audio 3kHz (Video Color-bar) segment of Alignment Tape.  
 2. Place the machine in the horizontal position.  
 3. Temporarily solder a resistor of 1k ohms between SV-7 board TP-8 and TP-9 (REG 12V).



**Spec.** Audio Line Output =  $3,000 \pm 6Hz$   
 (AU-7 board TP-3)

**Adj.** Replacing the Capstan Pulley

| Pulley |              | Tape Speed Variation<br>(Audio Line Output Freq.) |                                  |
|--------|--------------|---------------------------------------------------|----------------------------------|
| Mark   | Part No.     |                                                   |                                  |
| A      | 3-653-318-01 | 6Hz                                               | Freq. down<br>↑<br>↓<br>Freq. up |
| B      | -11          | 6                                                 |                                  |
| C      | -21          | 6                                                 |                                  |
| D      | -31          | 6                                                 |                                  |
| E      | -41          | 6                                                 |                                  |
| F      | -51          | 6                                                 |                                  |
| G      | -61          | 6                                                 |                                  |
| H      | -71          | 6                                                 |                                  |
| I      | -81          | 6                                                 |                                  |

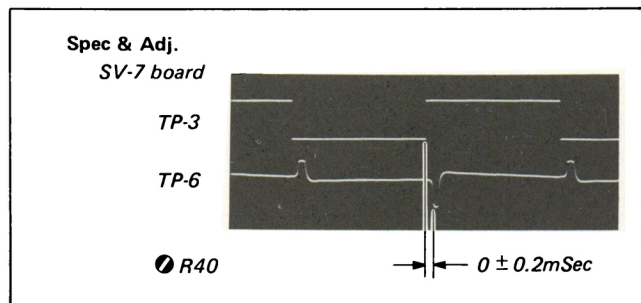


SERVO



### 9-3-4. TRACKING Control Calibration

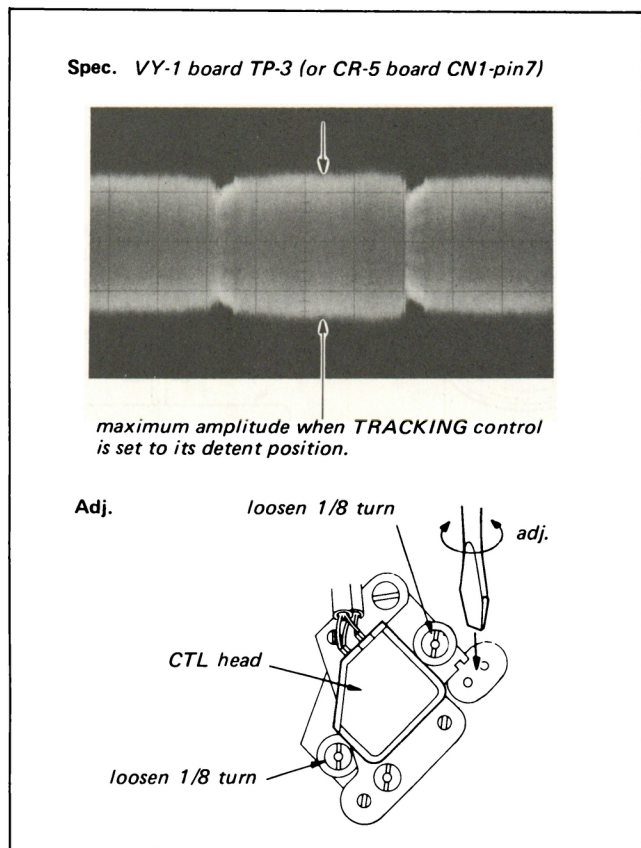
- Equipment;** Dual Trace Oscilloscope  
Mode; CHOP  
Trig; SV-7 board TP-3
- VTR;** 1. Mode; Playback of **Monoscope** Segment of Alignment Tape  
2. **TRACKING** Control; Detent Position



**CAUTION;** After completion of the adjustment, perform the next adjustment of CTL Head Position.

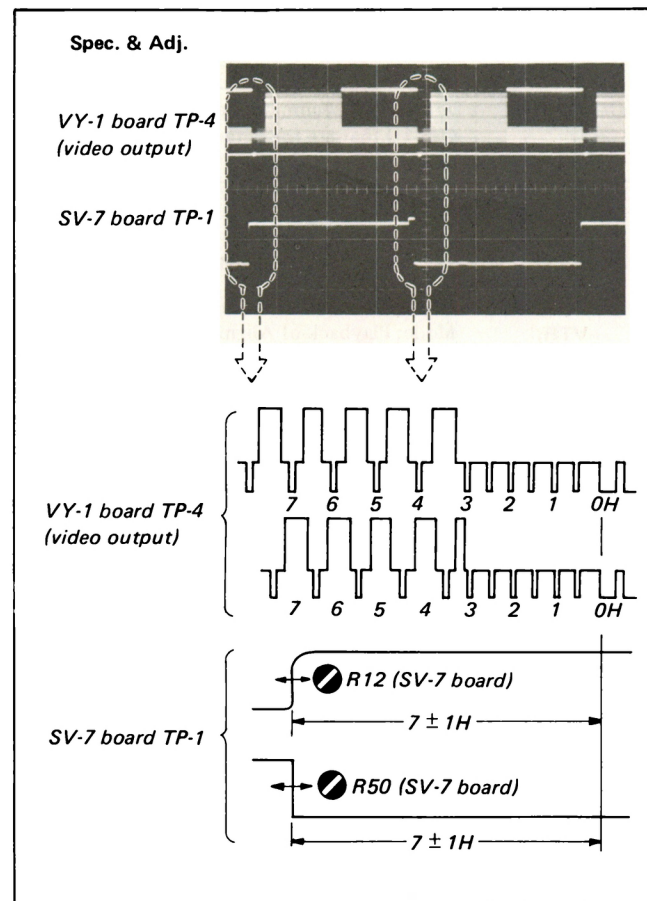
### 9-3-5. CTL Head Position Adjustment

- CAUTION;** Before starting this adjustment, perform the above adjustment of TRACKING Control Calibration.
- Equipment;** Oscilloscope  
Trig; SV-7 board TP-1
- VTR;** Mode; Playback of **Monoscope** Segment of Alignment Tape



### 9-3-6. Switching Position Adjustment

- CAUTION;** Before starting this adjustment, perform the adjustments of TRACKING Control Calibration and CTL Head Position.
- Equipment;** Dual Trace Oscilloscope  
Mode; CHOP  
Trig; SV-7 board TP-1
- VTR;** Mode; Playback of **Color-bar** Segment of Alignment Tape



### 9-3-7. Drum Lock Phase Adjustment

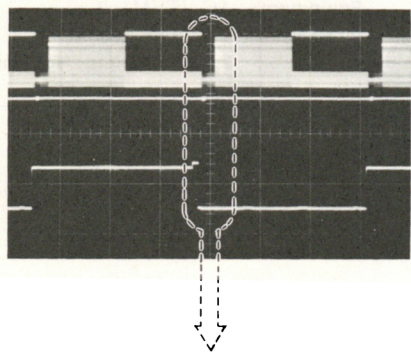
- CAUTION;** Before starting this adjustment, perform "the Drum Free Speed Adjustment" and "the Switching Position Adjustment".
- Equipment;** Dual Trace Oscilloscope  
Mode; CHOP  
Trig; SV-7 board TP-1
- VTR;** 1. Mode; **Record**  
2. Video Input; Ordinary Color Video Signal



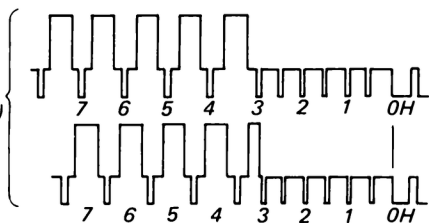
# Spec. & Adj.

VY-1 board TP-4  
(E-E video output)

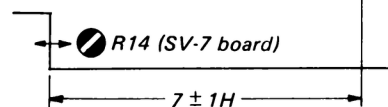
SV-7 board TP-1



VY-1 board TP-4  
(E-E video output)



SV-7 board TP-1



## 9-4. AUDIO SYSTEM ALIGNMENT

Alignment Tape; KR5-1 Part No. 8-969-995-01

| Counter | Time | Video         | Audio      |
|---------|------|---------------|------------|
| 000-100 | 5min | —             | —          |
| 100-280 | 10   | 75% Color-bar | 3kHz —5dB  |
| 280-430 | 10   | Monoscope     | 7kHz —25dB |
| 430-560 | 10   | RF Sweep      | 333Hz —5dB |
| 560-870 |      | —             | —          |

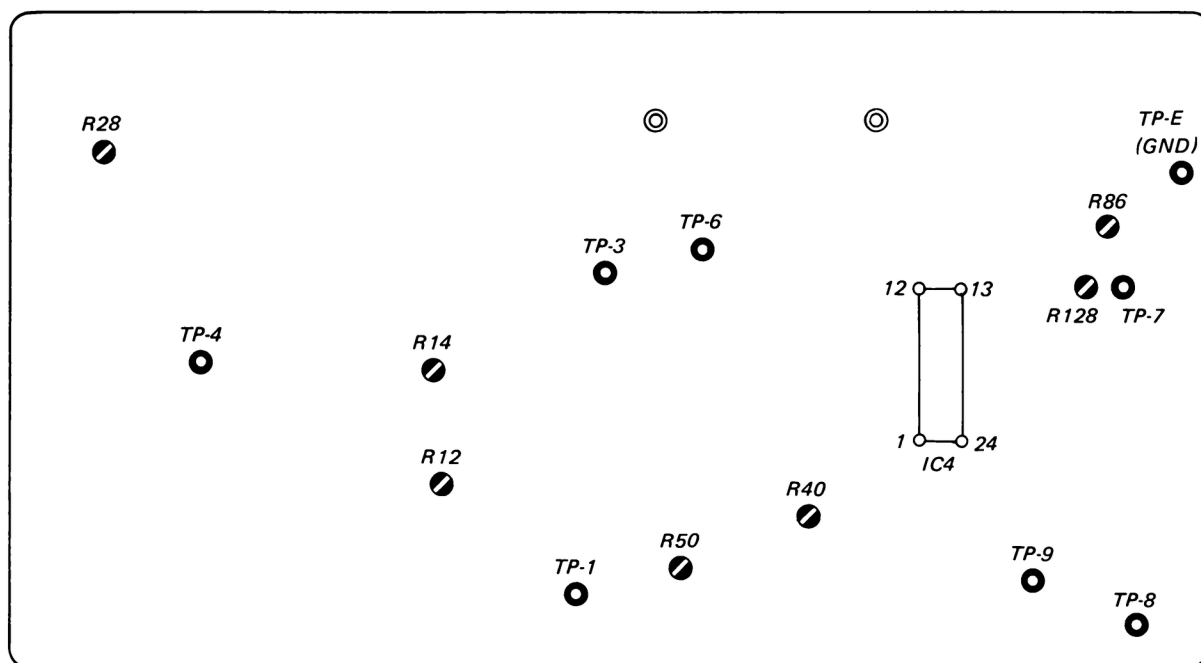
**CAUTION;** Don't use alignment tape KR5-1L and KR5-1D that are for Betamax-X2.

### 9-4-1. Audio Head Height Adjustment

Refer to the Section 8.

### 9-4-2. Audio Head Azimuth Adjustment

Refer to the Section 8.

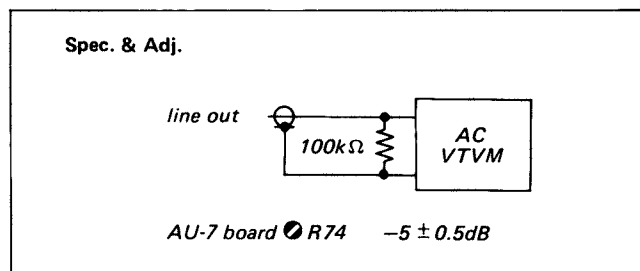


SV-7 board (soldering side)



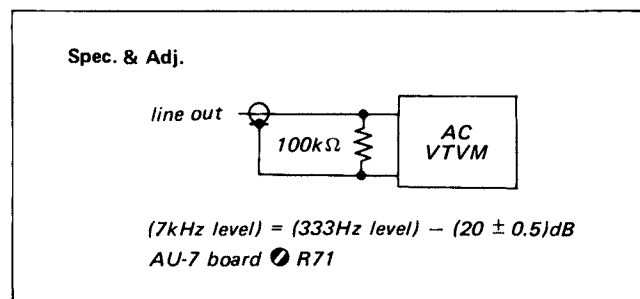
### 9-4-3. Audio Playback Level Adjustment

**Equipment;** AC VTVM  
**VTR;** Mode; Playback of **Audio 333Hz** (Video RF Sweep Segment) of Alignment Tape



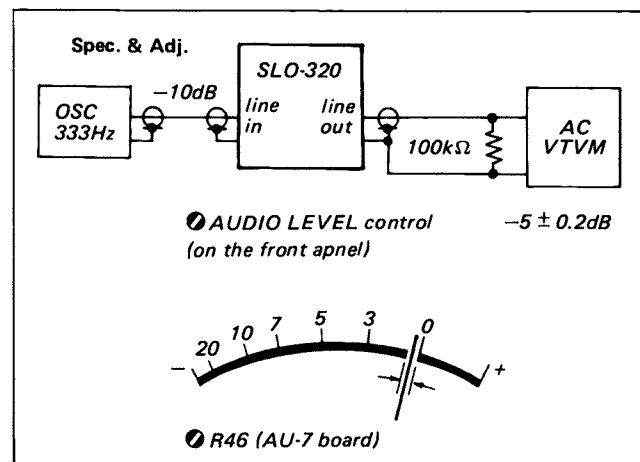
### 9-4-4. Audio Playback Frequency Response Adjustment

**Equipment;** AC VTVM  
**VTR;** Mode; Playback of **Audio 333Hz** (Video RF Sweep Segment) and **Audio 7kHz** (Video Monoscope Segment) of Alignment Tape



### 9-4-5. AUDIO LEVEL Control Setting and Meter Calibration

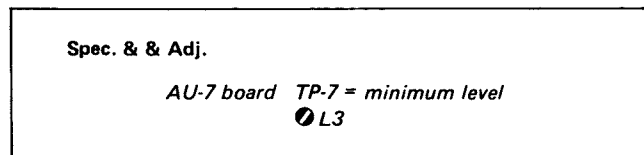
**Equipment;** 1. 333Hz Sine Wave Oscillator  
 2. AC VTVM  
**VTR;** 1. Mode; E-to-E or Record  
 2. Audio Line Input; 333Hz -10dB  
 3. LIMITER Switch; OFF



**CAUTION;** The AUDIO LEVEL control should be in this position for the following all the audio adjustments. DO NOT TOUCH the control.

### 9-4-6. Audio Record Amplifier Bias Trap Adjustment

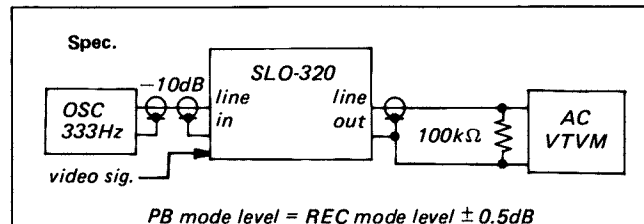
**Equipment;** AC VTVM  
**VTR;** 1. Mode; Record  
 2. Audio Input; No Signal



### 9-4-7. Audio Record Level Adjustment

**CAUTION;** The AUDIO LEVEL control should be in the position specified in the Section 9-4-5.

**Equipment;** 1. 333Hz Sine Wave Oscillator  
 2. AC VTVM  
**VTR;** 1. Mode; Record → Playback  
 2. Audio Line Input; 333Hz -10dB  
 3. Video Input; Ordinary Video Signal  
 4. LIMITER Switch; OFF



#### Adj.

1. Write down the line output level in the record mode and playback mode.
2. Using a jumper, short between TP-10 on the AU-7 board and GND, and then measure and write down the level and then AU-7 board TP-11 in the record mode.
3. Referring the following correction table, vary the level at the AU-7 board TP-11 with the AU-7 board Ⓢ R54, while TP-10 and GND are shorted in the record mode.

| <i>PB mode - REC mode<br/>(before adjustment)</i> | <i>correction value (TP-11 Ⓢ R54)<br/>(TP-10/GND shorted, REC mode)</i> |
|---------------------------------------------------|-------------------------------------------------------------------------|
| +0.5dB                                            | -0.4dB                                                                  |
| +1.0                                              | -0.8                                                                    |
| +2.0                                              | -1.6                                                                    |
| +3.0                                              | -2.5                                                                    |
| +4.0                                              | -3.4                                                                    |
| +5.0                                              | -4.4                                                                    |
| +6.0                                              | -5.2                                                                    |

*Ex. Before adjustment;*

$$(PB \text{ mode level}) - (REC \text{ mode level}) = +2.0\text{dB}$$

*Adjustment;*

Decrease the level by 1.6dB at TP-11 with Ⓢ R54.  
 (while TP-10/GND shorted in the record mode)

4. After the adjustment, remove the jumper between TP-10 and GND and then record and play back the 333Hz -10dB. Confirm that the PB level matches the specifications. If not, repeat the adjustment.



9-4-8. Audio Bias Current Adjustment  
(Audio Overall Frequency Response Adjustment)

- Equipment; 1. 333Hz and 7kHz Sine Wave Oscillator  
2. AC VTVM
- VTR; 1. Mode; Record → Playback  
2. Audio Line Input; 333Hz/7kHz -30dB  
3. Video Input; Ordinary Video Signal  
4. LIMITER Switch; OFF

Spec.

7kHz PB level = 333Hz PB level  $\pm$  0.5dB

Adj.

1. Write down the PB level of 333Hz and 7kHz.
2. Measure and write down the level (mVrms) at AU-7 board TP-11 in the record mode.
3. Referring the following correction table, vary the level at AU-7 board TP-11 with the AU-7 board  $\odot$  C65 in the record mode.

| 7kHz -333Hz PB level<br>(before adjustment) | correction value<br>(TP-11 $\odot$ C65, REC mode) |
|---------------------------------------------|---------------------------------------------------|
| +2.0dB                                      | +1.8mVrms                                         |
| +1.0                                        | +1.0                                              |
| +0.5                                        | +0.4                                              |
| -0.5                                        | -0.4                                              |
| -1.0                                        | -0.8                                              |
| -2.0                                        | -1.6                                              |
| -3.0                                        | -2.4                                              |
| -4.0                                        | -3.0                                              |
| -5.0                                        | -3.8                                              |
| -6.0                                        | -4.2                                              |

Ex. Before adjustment;  
7kHz -333Hz PB level = -2.0dB

Adjustment;  
↓  
Decrease the level by 1.6mVrms at TP-11 with  $\odot$  C65

4. After adjustment, record and play back the 333Hz and 7kHz. Confirm that the PB level matches the specifications. If not, repeat the adjustment.

9-4-9. Dub Mode Bias/Erase Osc. Freq. Adjustment

- Equipment; Frequency Counter
- VTR; 1. Mode; Record → Audio Dubbing  
2. Audio Input; No signal

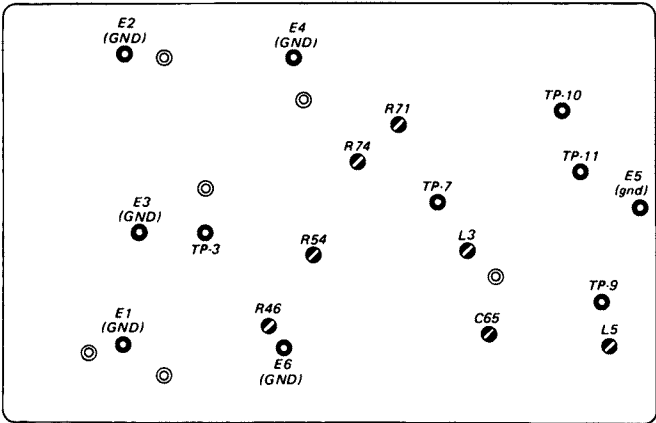
Spec. & Adj.

AU-7 board

TP-9 freq. (dub mode) = TP-9 freq. (record mode)  $\pm$  1kHz

$\odot$  L5

(Ref. TP-9 freq. in record mode  $\approx$  65kHz)



AU-7 board (soldering side)



## 9-5. VIDEO SYSTEM ALIGNMENT

Alignment Tape; KR5-1 Part No. 8-969-995-01

| Counter | Time | Video         | Audio      |
|---------|------|---------------|------------|
| 000-100 | 5min | —             | —          |
| 100-280 | 10   | 75% Color-bar | 3kHz -5dB  |
| 280-430 | 10   | Monoscope     | 7kHz -25dB |
| 430-560 | 10   | RF Sweep      | 333Hz -5dB |
| 560-870 |      | —             | —          |

**CAUTION;** MARKER FREQUENCY OF RF SWEEP SIGNAL

There are two types of alignment tape KR5-1. Take care markers are different.

Type 1; Marker 1, 2, 3.5 5.0MHz

Type 2; Marker 1, 2, 3.5, 4.5, 5.1MHz

**CAUTION;** Don't use alignment tape KR5-1L and KR5-1D that are for Betamax-X2.

**CAUTION;** When adjusting the VY-1 board, place the machine in the vertical position with its power transformer on its bottom.

### 9-5-1. PB RF Frequency Response Adjustment

**Note;** Perform adjustment for video channel A and channel B.

**Equipment;** Oscilloscope

Trig; SV-7 board TP-1

**VTR;** Mode; Playback of RF Sweep of Alignment Tape

#### 1. Best Tracking Adjustment

VY-1 board TP-3 (GND; E-1)

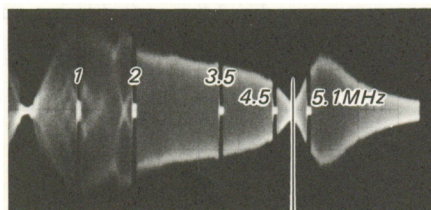
Control Panel **TRACKING** Control

Maximize the 1MHz amplitude of respective channel.

#### 2. Null Frequency Adjustment

VY-1 board

TP-3  
(GND; E-1)



CH-A  
⊗ R18 ↺ fully  
⊗ L5

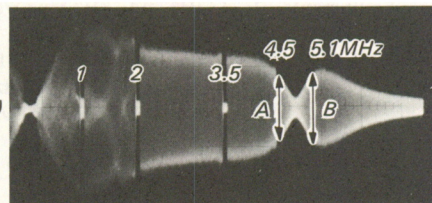
CH-B  
⊗ R16 ↺ fully  
⊗ L3

4.8 ± 0.1MHz

#### 3. Head Tuning Adjustment

VY-1 board

TP-3  
(GND; E-1)



CH-A  
⊗ R18 ↺ fully  
⊗ C4

CH-B  
⊗ R16 ↺ fully  
⊗ C1

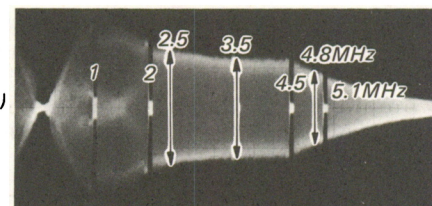
**Spec.**

| amplitude      |           |
|----------------|-----------|
| 4.5MHz         | 5.1MHz    |
| 100% Reference | 70 ~ 100% |

#### 4. Equalizing

VY-1 board

TP-3  
(GND; E-1)



CH-A  
⊗ R18

CH-B  
⊗ R16

**Spec. 1**

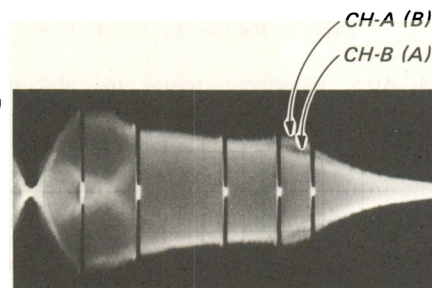
| amplitude      |           |           |
|----------------|-----------|-----------|
| 2.5MHz         | 3.5MHz    | 4.8MHz    |
| 100% Reference | 70 ~ 100% | 70 ~ 100% |

**Spec. 2** Envelope should not have peak nor dipping.

#### 5. Channel Balance Adjustment

Scope Trig; Int. (The CH-A's and CH-B's signals will overlap on the scope screen.)

VY-1 board  
TP-3  
(GND; E-1)



- Spec. 1.**
- Slope of high frequency range should be equal in CH-A and CH-B.
  - If required specifications cannot be met, adjust finely CH-A **⊗ C4** (**⊗ R18**) CH-B **⊗ C1** (**⊗ R16**) within the allowable limit given by step 4.



- Spec. 2.**
- Difference of 3.5MHz signal amplitude between CH-A and CH-B = 100 : 75 ~ 100.
  - If outside specifications,
    1. Check the pre-amplifier.
    2. Replace the video head (head disk) ass'y.
    3. If still outside specifications after head disk replacement, run the wrapping tape in PLAY mode for 10 seconds by wrapping tape K15C (8-899-602-00).

#### 9-5-2. PB Y/C RF Bias Trap Adjustment

**Equipment;** Oscilloscope  
**Trig;** SV-7 board TP-1  
**VTR;** Mode; Audio Dub to the tape with erased video track (Refer to the step 1.)

##### 1. Erasing the video track

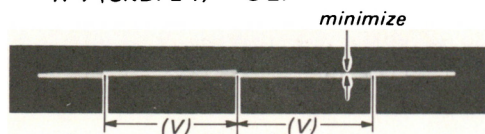
Disconnect the connector CN1 (10pins) from VY-1 board and then make recording for two minutes.

##### 2. Adjustment

Re-connect the CN1 to VY-1 board and then set the machine to Audio Dub mode using the erased tape by step 1.

VY-1 board

TP-3 (GND; E-1) Ⓞ L6  
 TP-7 (GND; E-1) Ⓞ L7



#### 9-5-3. Dropout Compensator Sensitivity Level Adjustment

**Equipment;** Dual Trace Oscilloscope  
**Mode;** ADD  
**Trig;** SV-7 board TP-1  
**VTR;** Mode; Playback of RF Sweep of Alignment Tape

**Spec. & Adj.**

VY-1 board  
 TP-3

Q3-C

TP-3 + Q3-C  
 (ADD)

Ⓞ R29

0.04 ~ 0.06V

#### 9-5-4. PB Y Output Level Adjustment

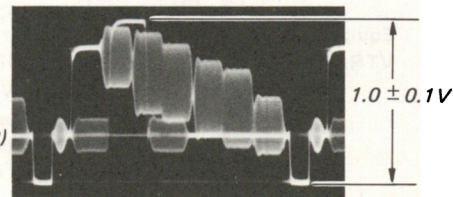
**Equipment;** Oscilloscope  
**VTR;** 1. Mode; Playback of Color-bar of Alignment Tape  
 2. Video Out (BNC); Terminated by 75Ω

**Spec. & Adj.**

VY-1 board

TP-4  
 (GND; E-2)

Ⓞ R53



#### 9-5-5. FM Carrier (Sync Tip) Frequency Adjustment

**Equipment;** Frequency Counter  
**VTR;** 1. Mode; E-to-E or Record  
 2. Video Input; No Signal  
 3. VY-1 board Ⓞ R158 (white clip);  
 mechanical center

**Spec. & Adj.**

VY-1 board

Q24

Q23

C82

R113

E-4

Ⓞ R164

frequency counter

3.50 ± 0.04MHz

**CAUTION;** After completing this adjustment, perform the section 9-5-8. White Clip Level Adjustment.

#### 9-5-6. FM Carrier Balance Adjustment

**Equipment;** Dual Trace Oscilloscope  
**Mode;** ALT  
**Polarity;** One Channel → Inverted  
 Another Channel → Normal  
**Trig;** Int.  
**VTR;** 1. Mode; E-to-E or Record  
 2. Video Input; No Signal  
 3. VY-1 board Ⓞ R158 (White Clip);  
 mechanical center

**Spec. & Adj.**

VY-1 board

Q24

Q23

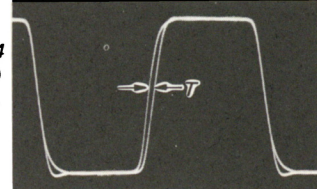
C82

R113

E-4

Ⓞ R161 T = 0

measuring point  
 (both channels of scope)



**CAUTION;** After completing this adjustment, perform the section 9-5-8. White Clip Level Adjustment.



### 9-5-7. FM Deviation Adjustment

**CAUTION;** Before starting this adjustment, perform the following adjustments.

9-5-4. PB Y Output Level Adjustment

9-5-5. FM Carrier Frequency Adjustment

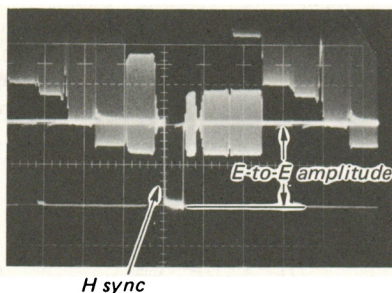
**Equipment;** Oscilloscope

**VTR;**

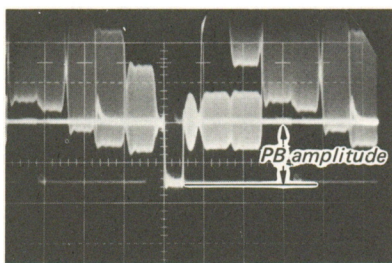
1. Mode; Record → Playback → E-to-E
2. Video Input; Ordinary Video Signal
3. Video Output (BNC); Terminated by 75Ω
4. VY-1 board R158 (White Clip); mechanical center

Spec. & Adj.  
VY-1 board

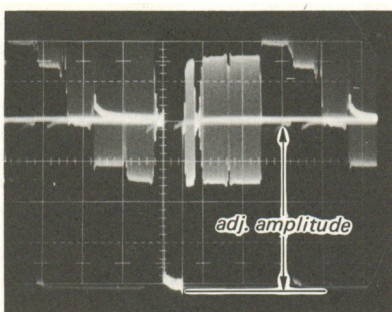
1. TP-4  
(recording)



2. TP-4  
(playback of above recorded tape)



3. TP-4  
(E-to-E or recording)



$$\text{adj. amplitude} = \frac{\text{E-to-E amplitude}}{\text{PB amplitude}} \times 0.3V$$

R150 (Adjust in the step 3.)

**CAUTION;** After completing this adjustment, perform the section 9-5-8. White Clip Level adjustment.

### 9-5-8. White Clip Level Adjustment

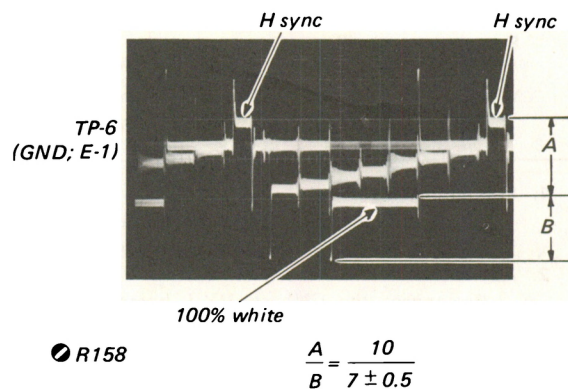
**CAUTION;** Before starting this adjustment, perform the section 9-5-7. FM Deviation Adjustment.

**Equipment;** Oscilloscope

**VTR;**

1. Mode; E-to-E or Record
2. Video Input; Video Signal having 100% White Peak

Spec. & Adj.  
VY-1 board



### 9-5-9. E-to-E Video Output Level Adjustment

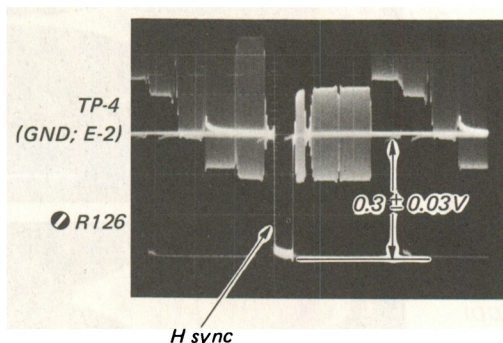
**CAUTION;** Before starting this adjustment, perform the section 9-5-7. FM Deviation Adjustment.

**Equipment;** Oscilloscope

**VTR;**

1. Mode; E-to-E or Record
2. Video Input; Ordinary Video Signal
3. Video Output (BNC); Terminated by 75Ω

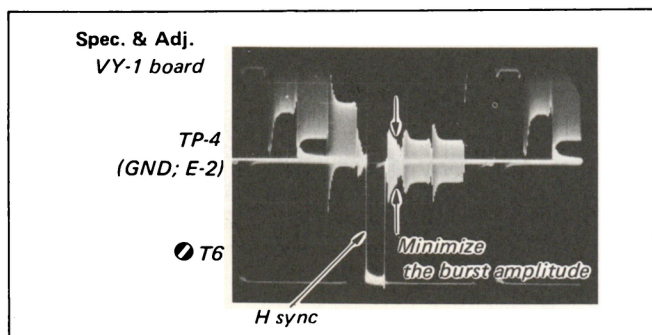
Spec. & Adj.  
VY-1 board





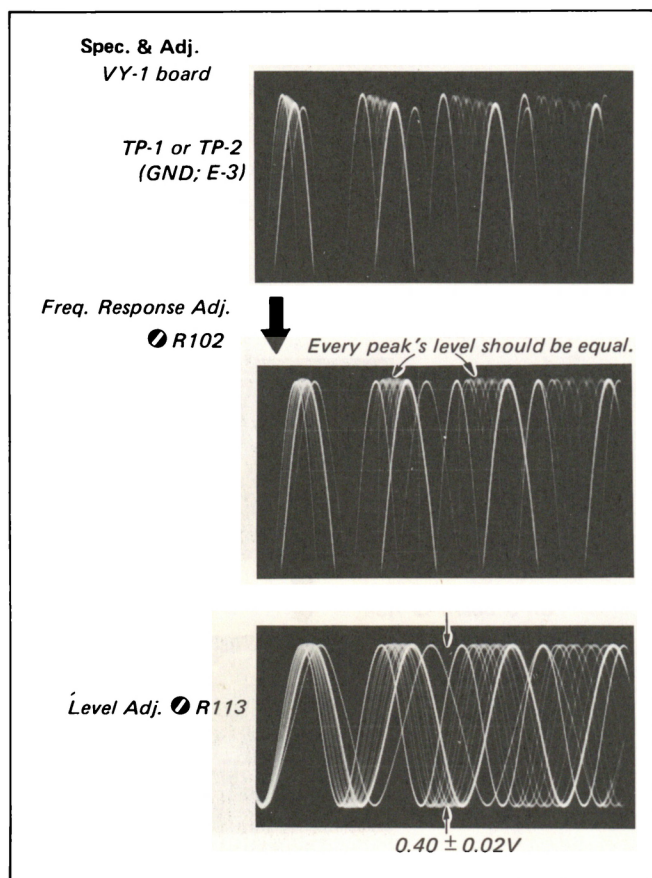
### 9-5-10. B/W Mode E-to-E Video 3.58MHz Trap Adj.

- Equipment;** Oscilloscope  
**VTR;** 1. Mode; E-to-E or Record  
 2. Video Input; Ordinary Color Video Signal  
 3. VY-1 board Q25 Base-Emitter (GND);  
 shorted



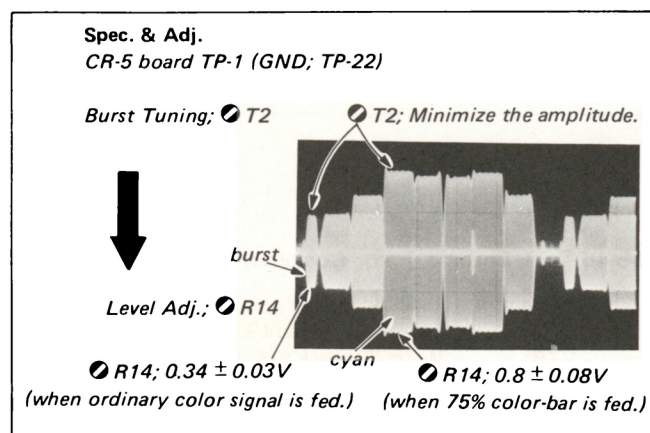
### 9-5-11. Y Record Current Freq. Response/Level Adj.

- Equipment;** Oscilloscope  
 Time Base; Extend as possible.  
 Trig; Int
- VTR;** 1. Mode; Record  
 2. Video Input; Ordinary Color Video Signal  
 3. VY-1 board Q19 collector-Emitter (GND);  
 shorted



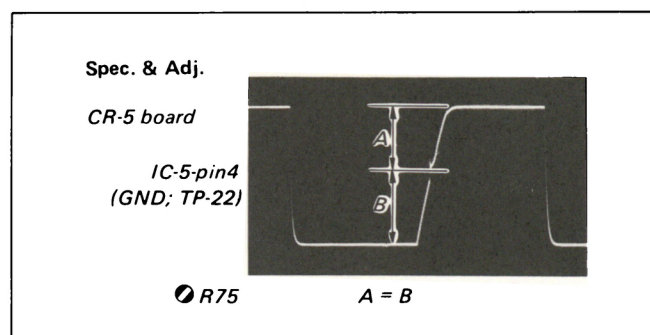
### 9-5-12. Record ACC Burst Tuning and Level Adjustment

- Equipment;** Oscilloscope  
**VTR;** 1. Mode; Record  
 2. Video Input; Ordinary Color Video Signal  
 or 75% Color-bar Signal  
 3. VY-1 board Q21 Collector-Emitter (GND);  
 shorted



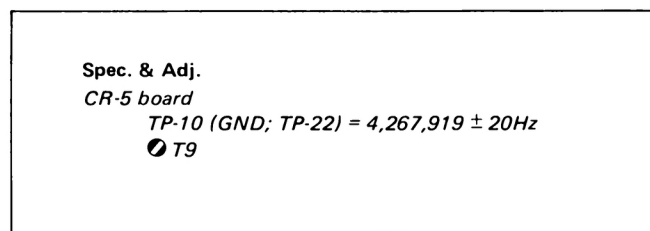
### 9-5-13. 44FH VCO Frequency Adjustment

- Equipment;** Oscilloscope  
**VTR;** 1. Mode; E-to-E or Record  
 2. Video Input; Ordinary Color Video Signal



### 9-5-14. 3.57MHz Osc. Frequency Adjustment

- Equipment;** Frequency Counter  
**VTR;** 1. Mode; E-to-E or Record  
 2. Video Input; Ordinary Color Video Signal





### 9-5-15. Reference 3.58MHz Osc. Frequency Adjustment

**Equipment;** Frequency Counter  
**VTR;** Mode; any

**Spec. & Adj.**  
 CR-5 board  
 TP-12 (GND; TP-22) =  $3,579,545 \pm 20\text{Hz}$   
 Ⓢ T7

### 9-5-16. PB Chroma Freq. Converter Balance Adjustment

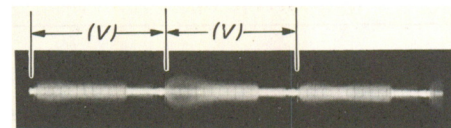
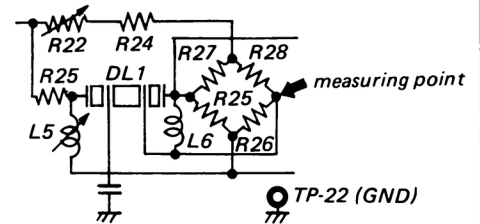
**Equipment;** Oscilloscope  
 Trig; SV-7 board TP-1  
**VTR;** Mode; Playback of Color-bar of Alignment Tape

**Spec. & Adj.**  
 CR-5 board  
 IC2-pin8  
 (GND; 22)  
 Ⓢ R7  
 Minimize this amplitude

### 9-5-18. PB Chroma Crosstalk Canceller Adjustment

**Equipment;** Oscilloscope  
 Trig; SV-7 board TP-1  
**VTR;** Mode; Playback of Color-bar of Alignment Tape

**Spec. & Adj.**  
 CR-5 board



Ⓢ R22 & Ⓢ L5  
 Minimize the amplitude.

### 9-5-19. PB Chroma Output Level Adjustment

**CAUTION;** Before starting this adjustment, perform the following adjustments.

- 9-5-4. PB Y Output Level Adjustment
- 9-5-17. PB ACK Level Adjustment

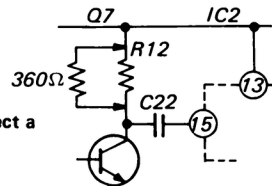
**Equipment;** Oscilloscope  
**VTR;** Mode; Playback of Color-bar of Alignment Tape

### 9-5-17. PB ACK Level Adjustment

**Equipment;** Oscilloscope, DC Voltage Meter or VOM  
**VTR;** 1. Mode; Playback of Color-bar of Alignment Tape  
 2. TRACKING Control; Detent Position

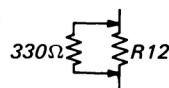
**Spec. & Adj.**  
 CR-5 board

1. Temporarily connect a resistor of  $360\Omega$ .



Turn Ⓢ R32 Ⓢ fully and then Ⓢ slowly until the point indicating approx. 3.5Vdc at TP-9.

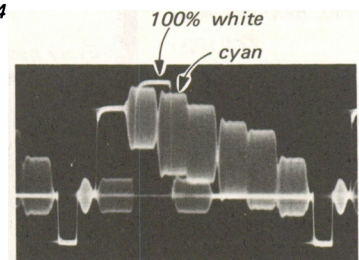
2. Change the resistor to  $330\Omega$ .



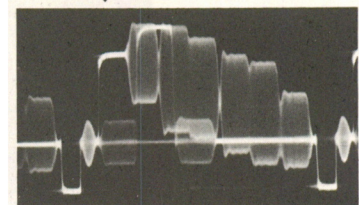
Confirm that the TP-9 dc voltage is now approx. 0Vdc. If it is approx. 3.5Vdc, repeat the step 1.

**Spec. & Adj.**

VY-1 board TP-4  
 (video output)



CR-5 board Ⓢ R34





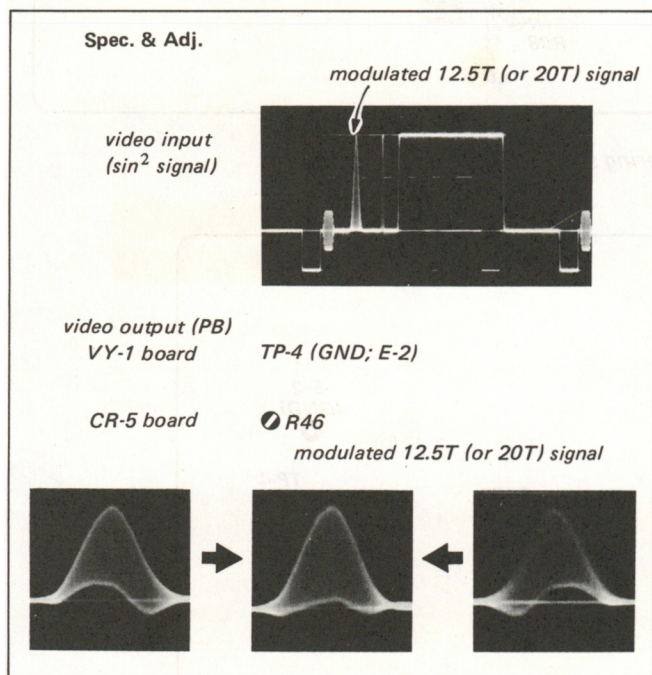
## 9-5-20. PB Chroma Delay Adjustment

**Note;** When a  $\sin^2$  signal is available for use in this adjustment, follow the Procedure A as indicated below.

When a  $\sin^2$  signal is not available, follow the Procedure B.

### Procedure A (using a $\sin^2$ signal)

- Equipment;** 1. Oscilloscope  
Trig; Int
2.  $\sin^2$  Signal Generator
- VTR;** 1. Mode; Record  $\rightarrow$  Playback
2. Video Input;  $\sin^2$  Signal



### Procedure B (using an ordinary color video signal)

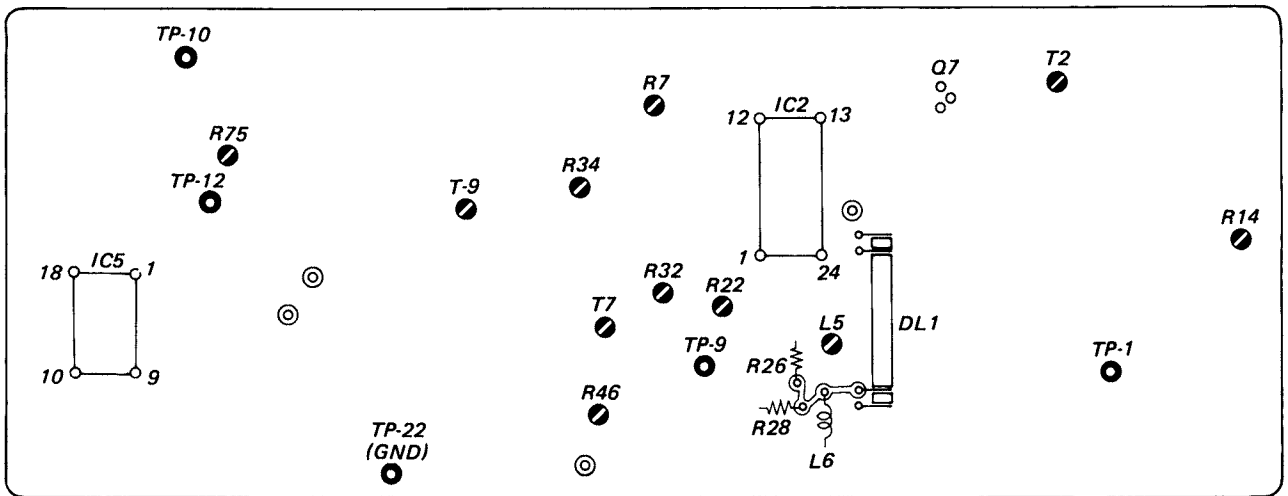
- Equipment;** Color Video Monitor
- VTR;** 1. Mode; Record  $\rightarrow$  Playback
2. Video Input; Ordinary Color Video Signal

#### Spec. & Adj.

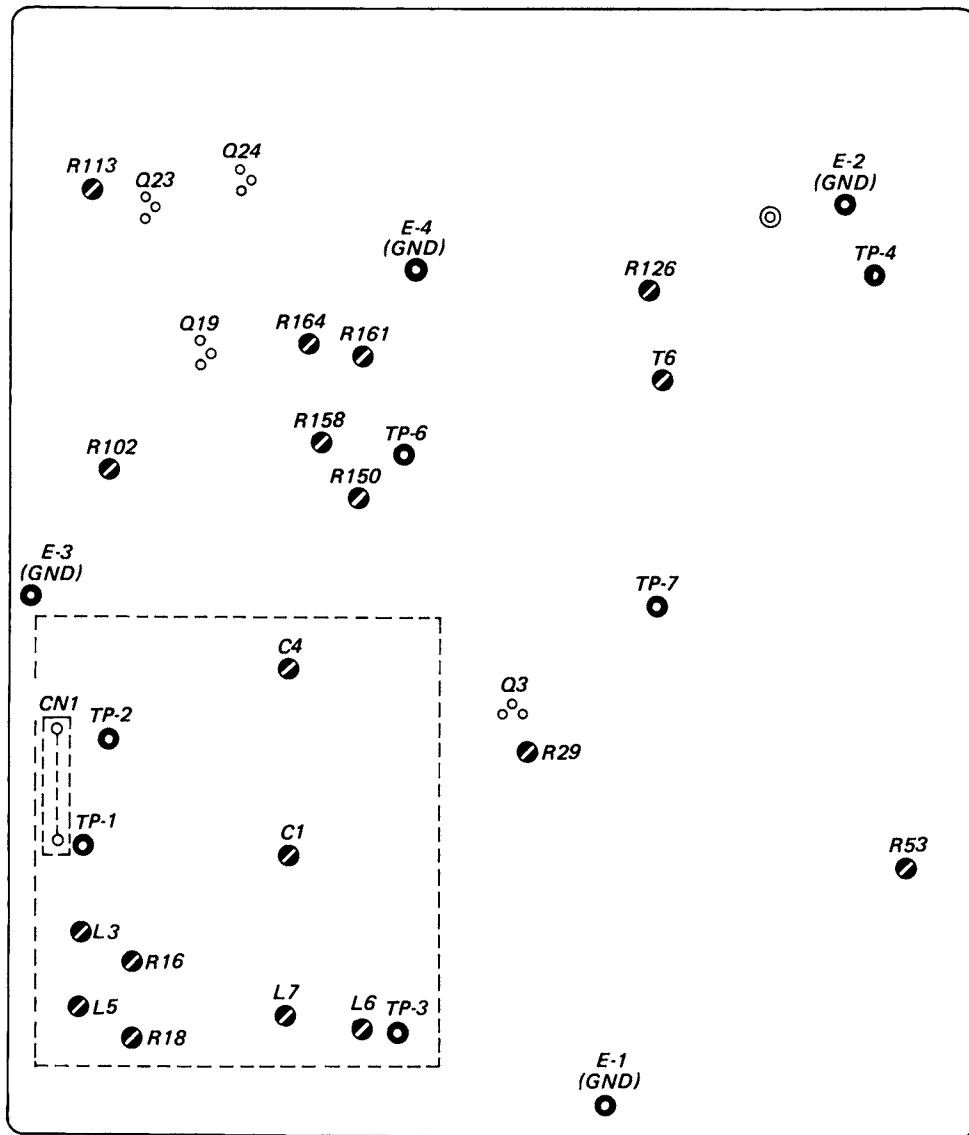
1. Record and play back an ordinary color video signal.
2. Observing the monitor screen in the playback mode, adjust the **CR-5 board R46** so that the phase difference between Y signal and chroma signal is equal to that of the video input.

(Ref.) The video input signal is displayed as an E-to-E video output signal on the monitor screen by pressing the REC button in the playback mode.





CR-5 board (soldering side)



VY-1 board (soldering side)



# SPARE PARTS AND JIGS

## PARTS INFORMATION

1. The stop ring (⊙) printed on the exploded views is interchangeable with the E-2.3 (⊙). Use the E-2.3 for maintenance purposes.
2. The stop ring (⊙) printed on the exploded views is interchangeable with the E-1.5 (⊙). Use the E-1.5 for maintenance purposes.
3. All the screws used in this machine are the TOSTU type. The screws are interchangeable with the Phillips type (⊕) and slotted type (⊖) screws. Please affix "TOSTU" to a screw name when ordering the TOSTU screws.
4. ( T) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.

(Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

5. For prompt and satisfactory maintenance service activity, the following parts are recommended to stock at your Maintenance Depot, or Service Center.

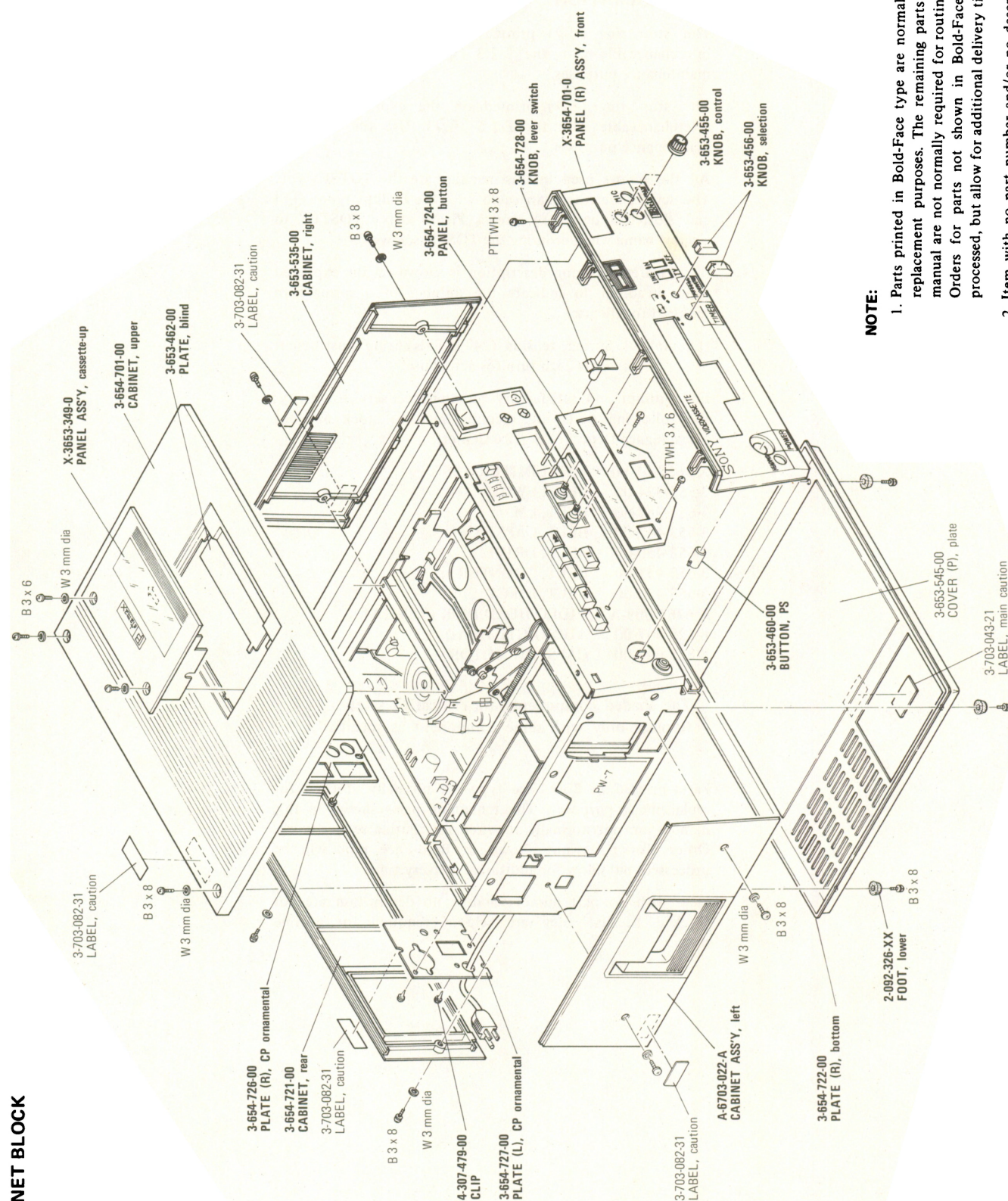
|              |                          |
|--------------|--------------------------|
| X-3653-310-0 | FWD LIMITER ASS'Y        |
| 3-653-324-00 | BELT, FWD                |
| 3-653-387-00 | BELT, LM                 |
| 3-653-442-00 | BELT, CAPSTAN            |
| 3-653-450-00 | BELT, DRIVE              |
| 3-653-451-00 | BELT, COUNTER            |
| 3-653-452-00 | BELT, EJECT              |
| A-6762-009-A | VIDEO HEAD DISK (RSV-1A) |
| 8-829-367-00 | AUDIO/CTL HEAD           |
| 8-835-007-00 | CAPSTAN MOTOR            |

6. **The shaded components are critical to safety.  
Replace only with same component as specified.**

7. Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
8. Item with no part number and/or no description are not stocked because they are seldom required for routine service.



## CABINET BLOCK



**NOTE:**

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2. Item with no part number and/or no description are not stocked because they are seldom required for routine service.



[illegible]

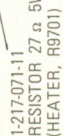
**The shaded components are critical to safety. Replace only with same component as specified.**

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## PTTWH 3 x 8

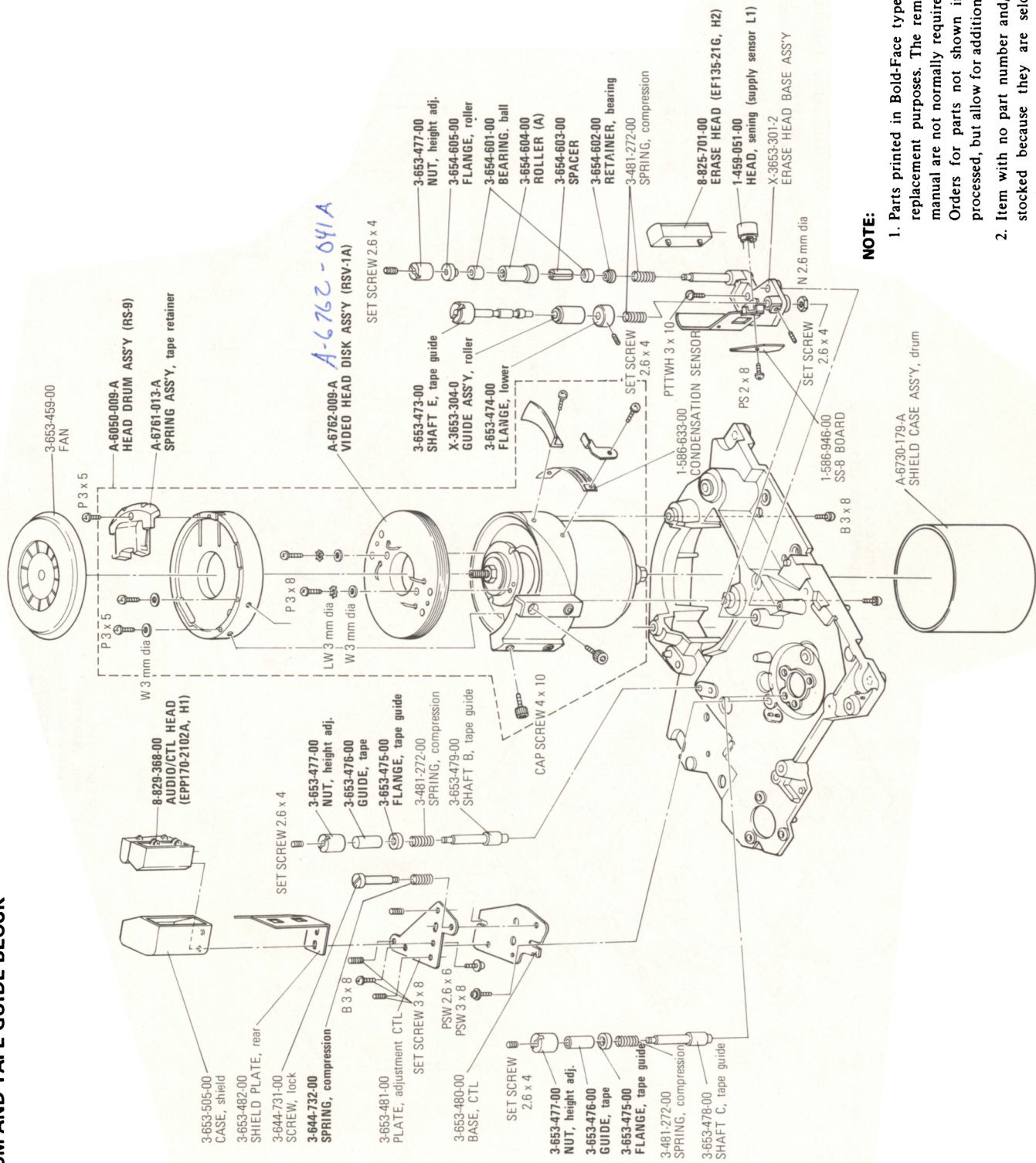


1. Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

2. Item with no part number and/or no description are not stocked because they are seldom required for routine

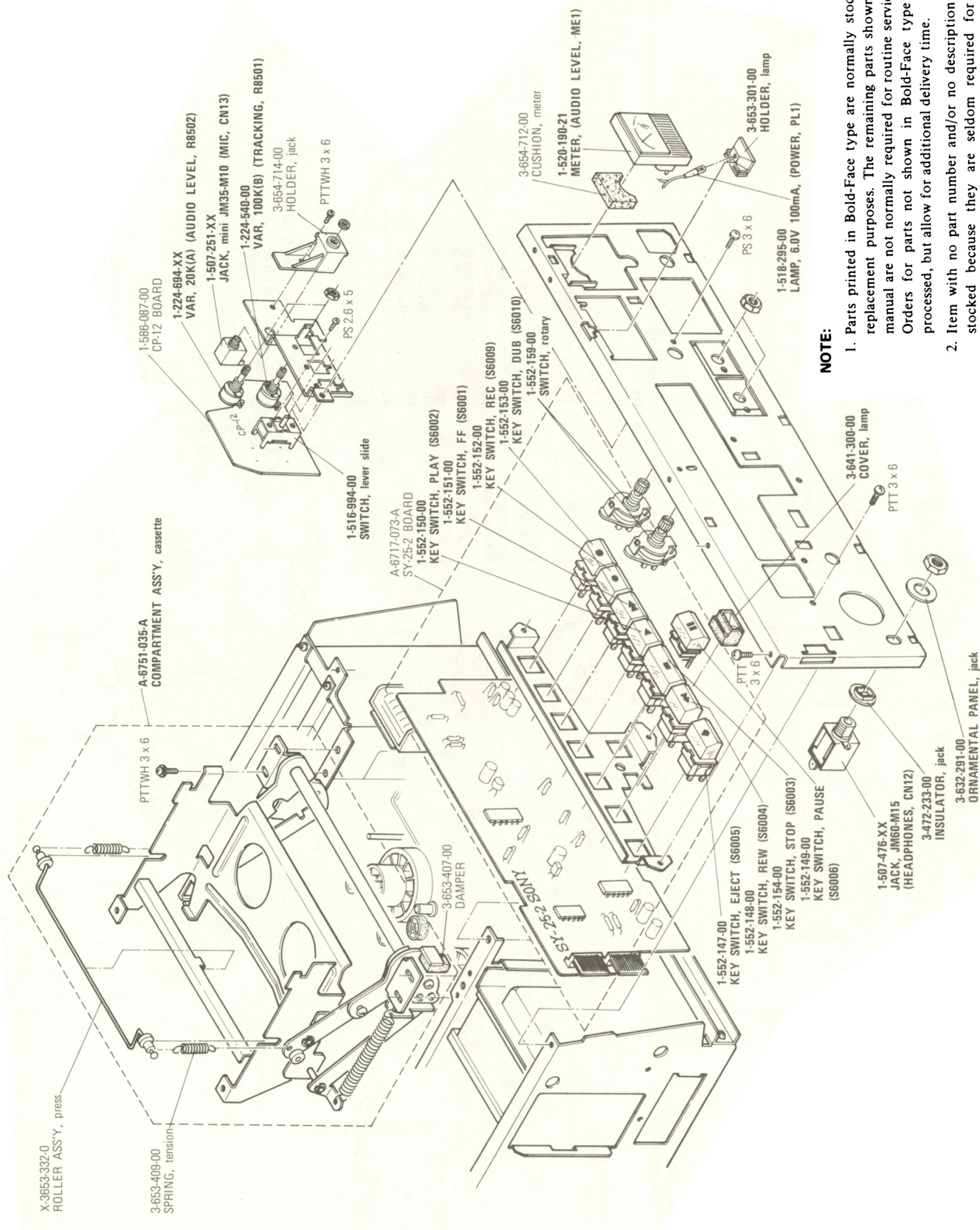


## DRUM AND TAPE GUIDE BLOCK





## FRONT PANEL AND CASSETTE—UP BLOCK

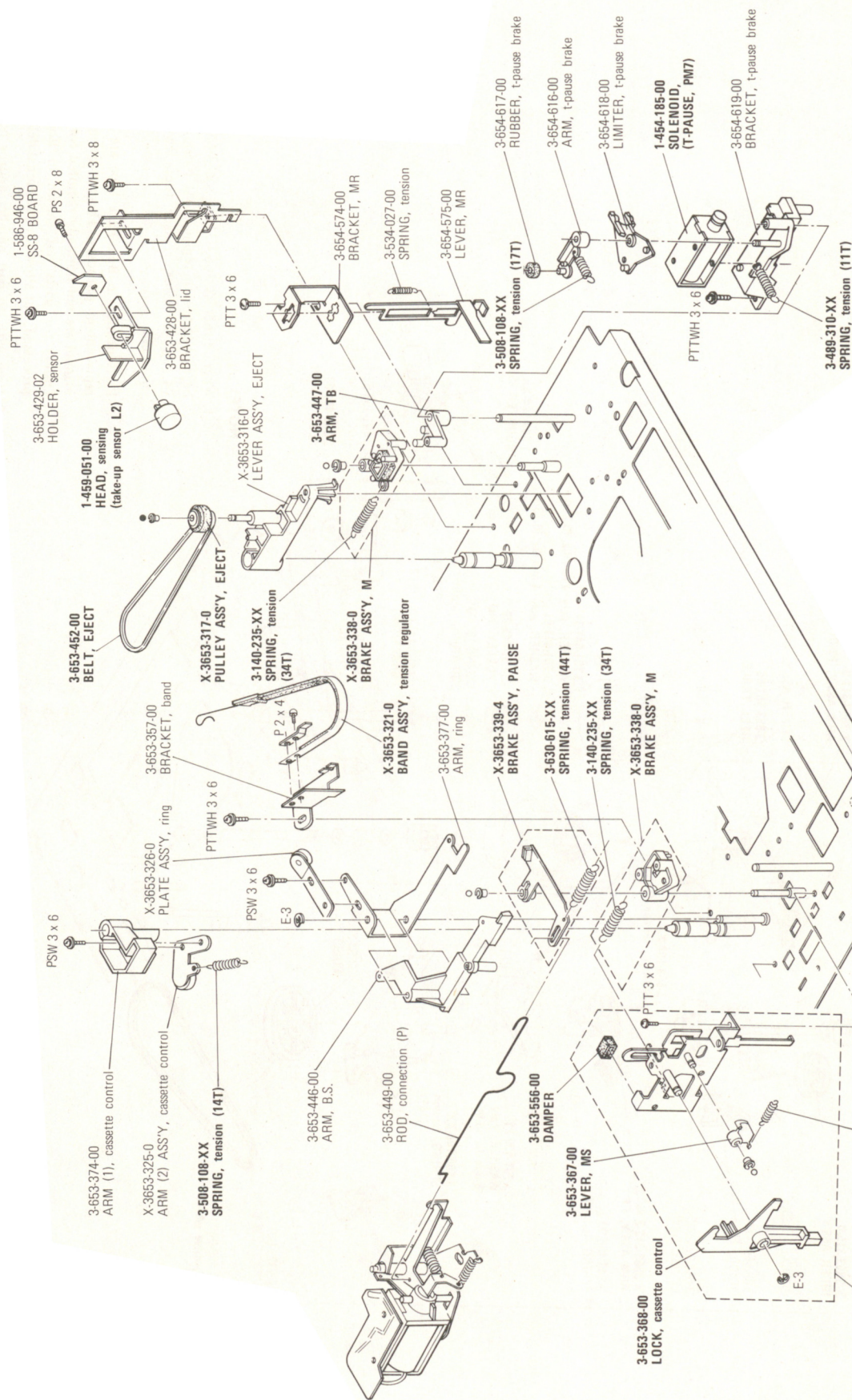


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**LINK BLOCK (1)**

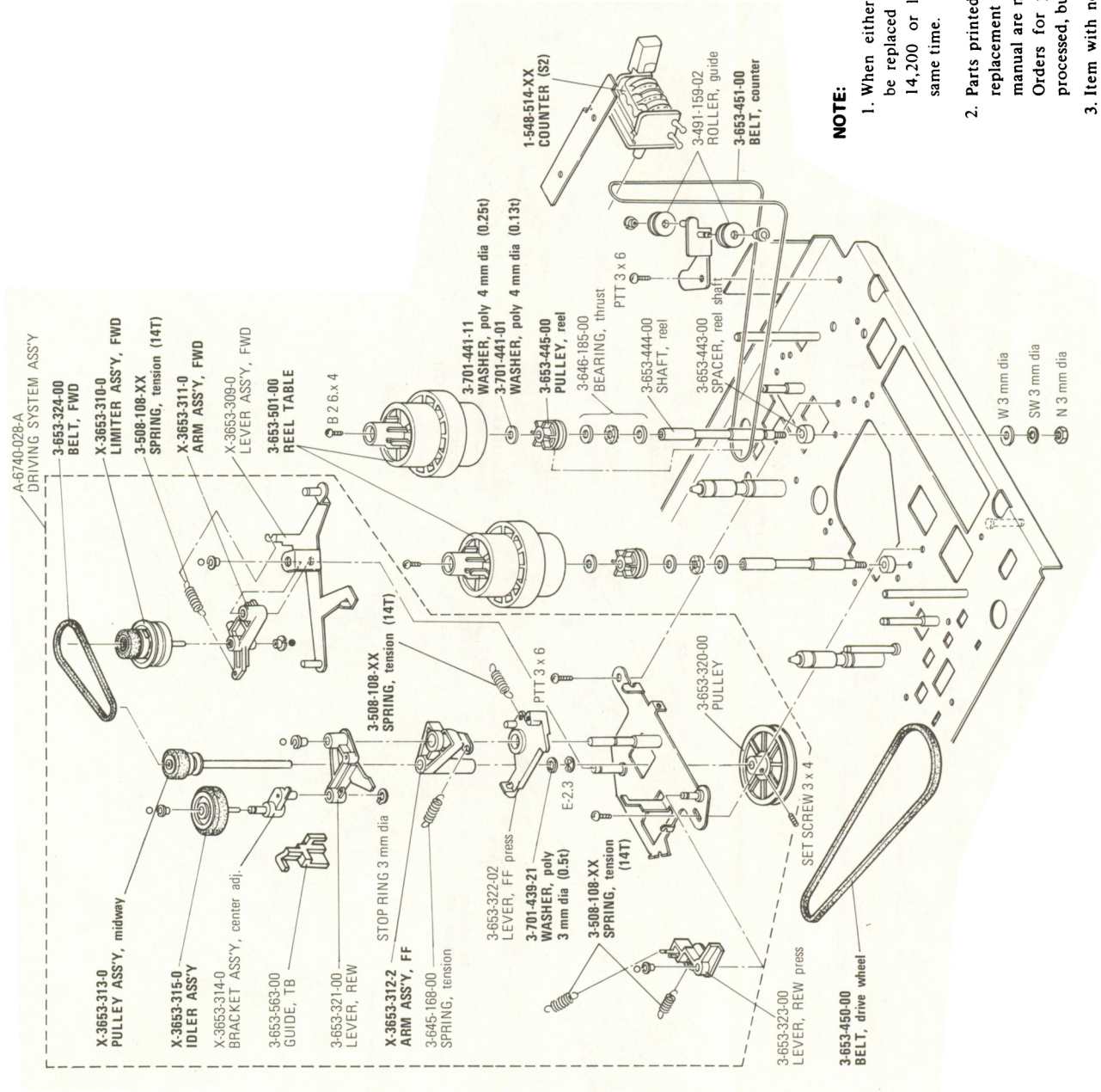


**NOTE:**

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## LINK BLOCK (2)

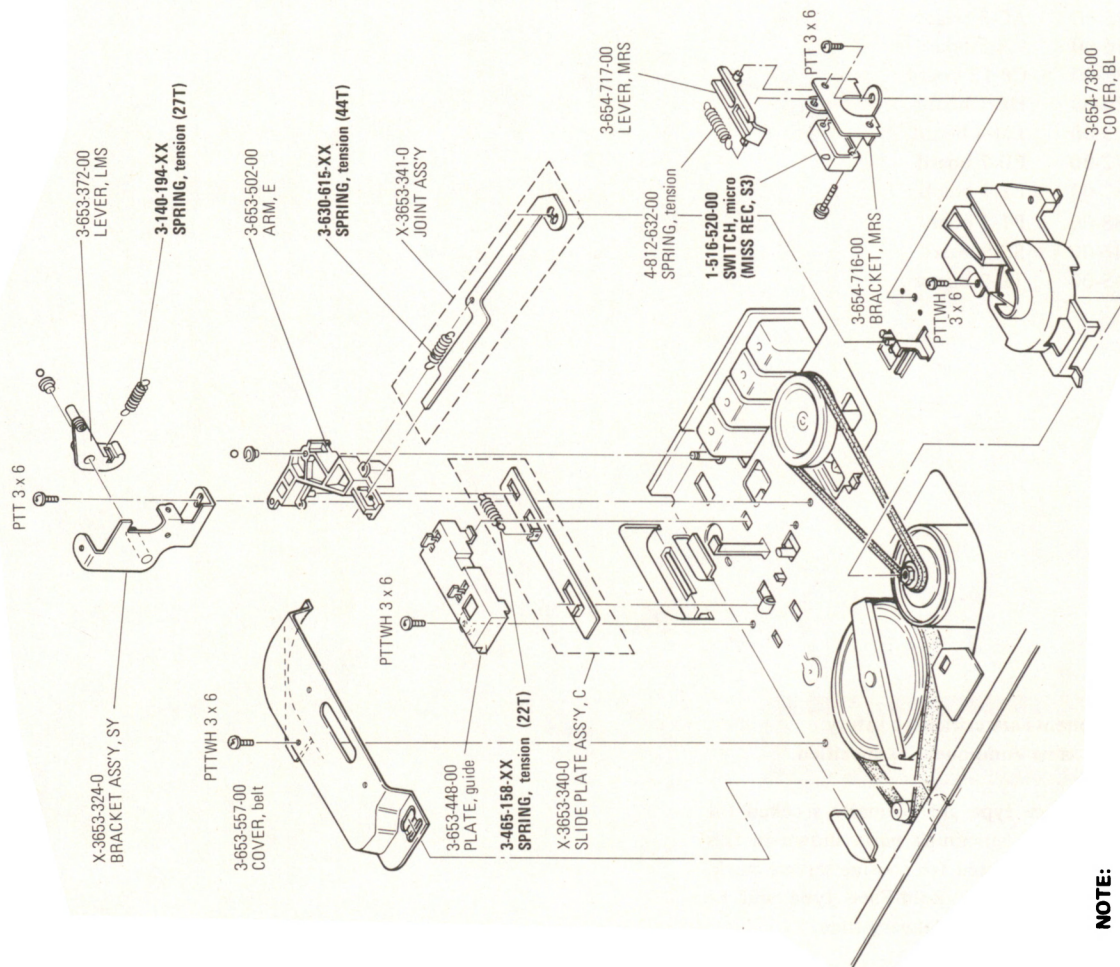


### NOTE:

1. When either X-3653-312- or 3-653-322- is going to be replaced with replacement parts in machine serial No. 14,200 or lower, replace these two parts both at the same time.
2. Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
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## LINK BLOCK (3)

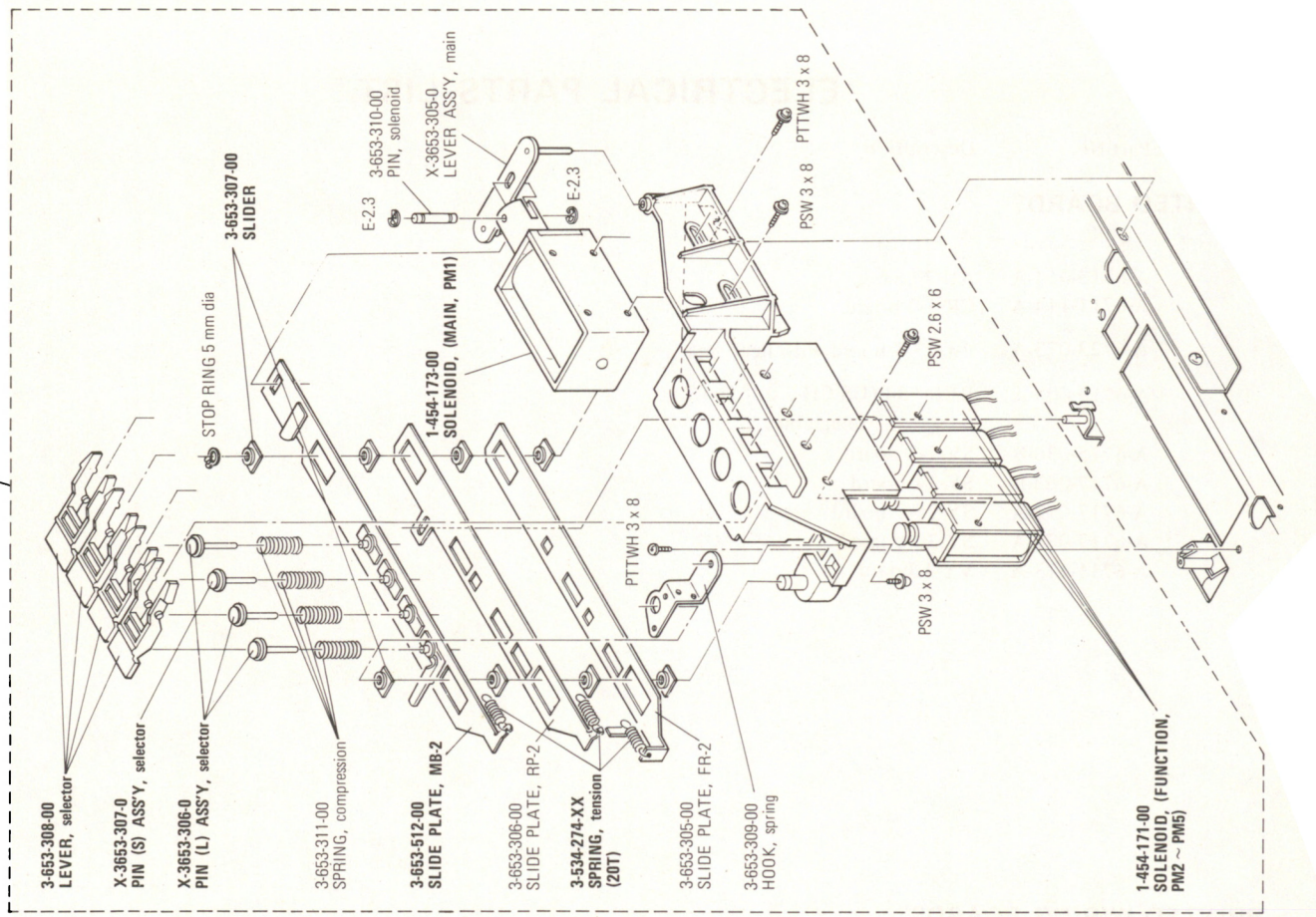


### NOTE:

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## FUNCTION BLOCK

### A-6734-055-A SOLENOID UNIT ASS'Y





# ELECTRICAL PARTS LIST

Ref. No.    Part No.    Description

## MOUNTED BOARDS

|              |                                          |
|--------------|------------------------------------------|
| A-6713-054-A | AU-7 board                               |
| A-6711-114-A | CR-5-2 board                             |
| A-6723-073-A | PW-17-3 board with heat sink             |
| A-6719-005-A | RFU-534 (US CH-3 or CH-4,<br>selectable) |
| A-6715-036-B | SV-7-2 board                             |
| A-6717-063-B | SY-24 board                              |
| A-6717-073-A | SY-25-2 board                            |
| A-6717-072-A | SY-30 board                              |
| A-6711-113-A | VY-1 board                               |

## PRINTED WIRING BOARDS

|                     |                   |
|---------------------|-------------------|
| 1-585-885-00        | AC-8 board        |
| 1-586-756-00        | CA-5 board        |
| 1-586-087-00        | CP-12 board       |
| 1-585-920-00        | HE-1 board        |
| 1-585-913-00        | LM-4 board        |
| <b>1-586-172-00</b> | <b>PD-7 board</b> |
| 1-585-887-00        | PT-1 board        |
| 1-585-888-00        | PT-2 board        |
| 1-586-946-00        | SS-8 board        |
| 1-586-215-00        | TL-2 board        |

### NOTE:

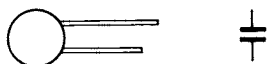
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Replace only with same component as specified.**
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.



## CAPACITORS

### CERAMIC CAPACITOR

0.5 pF through 820 pF  
50WV



| Value  | Part No.     |
|--------|--------------|
| 0.5 pF | 1-101-837-11 |
| 1      | 1-102-934-11 |
| 1.5    | 1-101-576-11 |
| 2      | 1-102-935-11 |
| 3      | 1-102-936-11 |
| 4      | 1-102-937-11 |
| 5      | 1-102-942-11 |
| 6      | 1-102-943-11 |
| 7      | 1-102-944-11 |
| 8      | 1-102-945-11 |
| 9      | 1-102-946-11 |
| 10     | 1-102-947-11 |
| 11     | 1-102-948-11 |
| 12     | 1-102-949-11 |
| 13     | 1-102-950-11 |
| 15     | 1-102-951-11 |
| 16     | 1-102-952-11 |
| 18     | 1-102-953-11 |
| 20     | 1-102-958-11 |
| 22     | 1-102-959-11 |

| Value | Part No.     |
|-------|--------------|
| 24 pF | 1-102-960-11 |
| 27    | 1-102-961-11 |
| 30    | 1-102-962-11 |
| 33    | 1-102-963-11 |
| 36    | 1-102-964-11 |
| 39    | 1-102-965-11 |
| 43    | 1-102-966-11 |
| 47    | 1-101-880-11 |
| 51    | 1-101-882-11 |
| 56    | 1-101-884-11 |
| 62    | 1-101-886-11 |
| 68    | 1-101-888-11 |
| 75    | 1-101-890-11 |
| 82    | 1-102-971-11 |
| 91    | 1-102-972-11 |
| 100   | 1-102-973-11 |
| 110   | 1-102-815-11 |
| 120   | 1-102-816-11 |
| 130   | 1-101-081-11 |
| 150   | 1-101-361-11 |

| Value  | Part No.     |
|--------|--------------|
| 160 pF | 1-101-367-11 |
| 180    | 1-102-976-11 |
| 200    | 1-102-977-11 |
| 220    | 1-102-978-11 |
| 240    | 1-102-979-11 |
| 270    | 1-102-980-11 |
| 300    | 1-102-981-11 |
| 330    | 1-102-820-11 |
| 360    | 1-102-821-11 |
| 390    | 1-102-822-11 |
| 430    | 1-102-823-11 |
| 470    | 1-102-824-11 |
| 510    | 1-101-059-11 |
| 560    | 1-102-115-11 |
| 680    | 1-102-116-11 |
| 820    | 1-102-117-11 |

### CERAMIC CAPACITOR

0.001  $\mu$ F through 0.1  $\mu$ F  
50WV



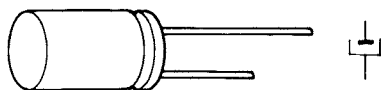
1-161-□□□-11

| Value         | Part No.<br>-□□□- | Substitute     |
|---------------|-------------------|----------------|
| 0.001 $\mu$ F | 039               | (1-102-074-11) |
| 0.0012        | 040               |                |
| 0.0015        | 041               |                |
| 0.0018        | 042               |                |
| 0.0022        | 043               | (1-102-100-11) |
| 0.0027        | 044               |                |
| 0.0033        | 045               |                |
| 0.0039        | 046               | (1-102-124-11) |
| 0.0047        | 047               |                |
| 0.0056        | 048               |                |
| 0.0068        | 049               |                |
| 0.0082        | 050               |                |

| Value        | Part No.<br>-□□□- | Substitute     |
|--------------|-------------------|----------------|
| 0.01 $\mu$ F | 051               | (1-101-118-11) |
| 0.012        | 052               |                |
| 0.015        | 053               |                |
| 0.018        | 054               |                |
| 0.022        | 055               | (1-101-005-11) |
| 0.027        | 056               |                |
| 0.033        | 057               |                |
| 0.039        | 058               |                |
| 0.047        | 059               | (1-101-006-11) |
| 0.056        | 060               |                |
| 0.068        | 061               |                |
| 0.082        | 062               |                |
| 0.1          | 063               |                |



## ELECTROLYTIC CAPACITOR

0.47  $\mu$ F through 470  $\mu$ F  
6.3V through 50V

| Value            | Part No.     | Value            | Part No.     |
|------------------|--------------|------------------|--------------|
| 0.47 $\mu$ F 50V | 1-121-726-11 | 100 $\mu$ F 6.3V | 1-123-196-11 |
| 1 50             | 1-121-391-11 | 10               |              |
| 2.2 50           | 1-121-450-11 | 16               | 1-123-193-11 |
| 3.3 25           | 1-121-392-11 | 25               | 1-121-935-11 |
| 50               | 1-123-181-11 | 35               | 1-123-059-11 |
| 4.7 25           | 1-121-395-11 | 50               |              |
| 50               | 1-123-182-11 | 220 6.3          | 1-123-198-11 |
| 10 10            | 1-121-651-11 | 10               | 1-123-072-11 |
| 16               |              | 16               | 1-123-068-11 |
| 25               | 1-123-187-11 | 25               | 1-121-936-11 |
| 50               | 1-123-183-11 | 35               | 1-121-937-11 |
| 22 16            | 1-123-191-11 | 50               |              |
| 25               | 1-123-188-11 | 330 6.3          | 1-123-076-11 |
| 35               | 1-123-056-11 | 10               | 1-123-073-11 |
| 50               |              | 16               | 1-123-069-11 |
| 33 10            | 1-123-194-11 | 25               | 1-123-065-11 |
| 25               | 1-123-189-11 | 35               | 1-123-060-11 |
| 35               | 1-123-057-11 | 50               |              |
| 50               |              | 470 6.3          | 1-123-077-11 |
| 47 10            | 1-123-195-11 | 10               | 1-121-938-11 |
| 16               | 1-123-192-11 | 16               | 1-121-940-11 |
| 25               | 1-123-190-11 | 25               |              |
| 35               | 1-123-058-11 | 35               | 1-121-983-11 |
| 50               |              | 50               |              |

Ref. No. Part No. Description

## VY-1 board

|       |              |          |                |     |  |
|-------|--------------|----------|----------------|-----|--|
| C1001 | 1-141-168-00 | trimmer  | 50pF           |     |  |
| C1004 | 1-141-168-00 | trimmer  | 50pF           |     |  |
| C1025 | 1-101-974-11 | ceramic  | 20pF(CH) 5%    | 50V |  |
| C1036 | 1-102-531-11 | ceramic  | 150pF(CH) 5%   | 50V |  |
| C1054 | 1-131-195-21 | tantalum | 33 $\mu$ F 10% | 10V |  |
| C1055 | 1-131-200-21 | tantalum | 15 $\mu$ F 10% | 16V |  |
| C1056 | 1-131-158-12 | tantalum | 10 $\mu$ F 20% | 16V |  |

Ref. No. Part No. Description

|       |              |          |                   |     |  |
|-------|--------------|----------|-------------------|-----|--|
| C1060 | 1-121-943-11 | elect    | 1000 $\mu$ F      | 10V |  |
| C1062 | 1-121-943-11 | elect    | 1000 $\mu$ F      | 10V |  |
| C1079 | 1-131-158-12 | tantalum | 10 $\mu$ F 20%    | 16V |  |
| C1114 | 1-108-227-12 | mylar    | 0.001 $\mu$ F 10% | 50V |  |
| C1115 | 1-131-209-21 | tantalum | 0.1 $\mu$ F 10%   | 35V |  |
| C1121 | 1-102-530-11 | ceramic  | 120pF(CH) 5%      | 50V |  |
| C1126 | 1-131-214-21 | tantalum | 0.68 $\mu$ F 10%  | 35V |  |
| C1127 | 1-131-158-12 | tantalum | 10 $\mu$ F 20%    | 16V |  |

## NOTE:

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Replace only with same component as specified.
- Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.



| Ref. No.     | Part No.     | Description               |          |     |      |               | Ref. No.     | Part No.      | Description |     |      |  |  |
|--------------|--------------|---------------------------|----------|-----|------|---------------|--------------|---------------|-------------|-----|------|--|--|
| AU-7 board   |              |                           |          |     |      | C3054         | 1-129-701-11 | polypropylene | 0.01μF      | 5%  | 100V |  |  |
| C2018        | 1-108-356-12 | mylar                     | 0.0082μF | 10% | 50V  | C3058         | 1-131-205-21 | tantalum      | 2.2μF       | 10% | 25V  |  |  |
| C2032        | 1-108-239-12 | mylar                     | 0.01μF   | 10% | 50V  | C3076         | 1-131-212-21 | tantalum      | 0.33μF      | 10% | 35V  |  |  |
| C2033        | 1-131-211-21 | tantalum                  | 0.22μF   | 10% | 35V  | C3079         | 1-131-215-21 | tantalum      | 1μF         | 10% | 35V  |  |  |
| C2037        | 1-108-359-12 | mylar                     | 0.027μF  | 10% | 50V  | C3082         | 1-131-232-21 | tantalum      | 4.7μF       | 10% | 16V  |  |  |
| C2038        | 1-108-228-12 | mylar                     | 0.0015μF | 10% | 50V  | C3083         | 1-131-232-21 | tantalum      | 4.7μF       | 10% | 16V  |  |  |
| C2039        | 1-109-156-11 | mica                      | 270pF    | 5%  | 300V | C3091         | 1-131-206-21 | tantalum      | 3.3μF       | 10% | 25V  |  |  |
| C2050        | 1-108-360-12 | mylar                     | 0.039μF  | 10% | 50V  | CR-5-2 board  |              |               |             |     |      |  |  |
| C2062        | 1-108-242-12 | mylar                     | 0.022μF  | 10% | 50V  | C4032         | 1-102-851-11 | ceramic       | 15pF(CH)    | 5%  | 50V  |  |  |
| C2063        | 1-108-244-12 | mylar                     | 0.033μF  | 10% | 50V  | C4042         | 1-131-210-21 | tantalum      | 0.15μF      | 10% | 35V  |  |  |
| C2064        | 1-129-709-11 | polypropylene             | 0.0039μF | 10% | 630V | C4043         | 1-131-237-21 | tantalum      | 1.5μF       | 10% | 25V  |  |  |
| C2065        | 1-141-010-XX | trimmer                   | 120pF    |     |      | C4052         | 1-102-512-11 | ceramic       | 16pF(CH)    | 5%  | 50V  |  |  |
| SV-7-2 board |              |                           |          |     |      | C4054         | 1-108-237-12 | mylar         | 0.0068μF    | 10% | 50V  |  |  |
| C3005        | 1-131-210-21 | tantalum                  | 0.15μF   | 10% | 35V  | C4056         | 1-108-237-12 | mylar         | 0.0068μF    | 10% | 50V  |  |  |
| C3008        | 1-108-242-12 | mylar                     | 0.022μF  | 10% | 50V  | C4061         | 1-102-852-11 | ceramic       | 47pF(CH)    | 5%  | 50V  |  |  |
| C3009        | 1-108-242-12 | mylar                     | 0.022μF  | 10% | 50V  | C4077         | 1-131-158-12 | tantalum      | 10μF        | 20% | 16V  |  |  |
| C3010        | 1-108-237-12 | mylar                     | 0.0068μF | 10% | 50V  | C4082         | 1-102-773-11 | ceramic       | 330pF(UJ)   | 5%  | 50V  |  |  |
| C3011        | 1-130-039-11 | polypropylene             | 0.068μF  | 5%  | 50V  | SY-24 board   |              |               |             |     |      |  |  |
| C3012        | 1-108-251-12 | mylar                     | 0.1μF    | 10% | 50V  | C5009         | 1-129-794-11 | polypropylene | 0.0033μF    | 5%  | 100V |  |  |
| C3017        | 1-129-701-11 | polypropylene             | 0.01μF   | 5%  | 100V | C5010         | 1-129-794-11 | polypropylene | 0.0033μF    | 5%  | 100V |  |  |
| C3018        | 1-129-879-11 | polypropylene             | 0.047μF  | 5%  | 50V  | C5014         | 1-129-794-11 | polypropylene | 0.0033μF    | 5%  | 100V |  |  |
| C3019        | 1-129-879-11 | polypropylene             | 0.047μF  | 5%  | 50V  | C5026         | 1-129-701-11 | polypropylene | 0.01μF      | 5%  | 100V |  |  |
| C3020        | 1-131-211-21 | tantalum                  | 0.22μF   | 10% | 35V  | C5027         | 1-129-701-11 | polypropylene | 0.01μF      | 5%  | 100V |  |  |
| C3021        | 1-131-213-21 | tantalum                  | 0.47μF   | 10% | 35V  | PW-17-3 board |              |               |             |     |      |  |  |
| C3025        | 1-131-205-21 | tantalum                  | 2.2μF    | 10% | 25V  | C8001         | 1-108-389-12 | mylar         | 0.1μF       | 10% | 100V |  |  |
| C3025        | 1-131-208-21 | SER NO. 10001~13000 (USA) |          |     |      | C8002         | 1-123-067-11 | elect         | 2200μF      |     | 25V  |  |  |
|              |              | SER NO. 12001~12200 (CND) |          |     |      | C8003         | 1-123-066-11 | elect         | 1000μF      |     | 25V  |  |  |
|              |              | SER NO. 13001~ (USA)      |          |     |      | C8007         | 1-123-067-11 | elect         | 2200μF      |     | 25V  |  |  |
|              |              | SER NO. 20201~ (CND)      |          |     |      | C8008         | 1-123-066-11 | elect         | 1000μF      |     | 25V  |  |  |
| C3032        | 1-131-212-21 | tantalum                  | 0.33μF   | 10% | 35V  | C8011         | 1-108-389-12 | mylar         | 0.1μF       | 10% | 100V |  |  |
| C3034        | 1-108-242-12 | mylar                     | 0.022μF  | 10% | 50V  | C8012         | 1-123-070-11 | elect         | 2200μF      |     | 16V  |  |  |
| C3035        | 1-131-213-21 | tantalum                  | 0.47μF   | 10% | 35V  | AC-8 board    |              |               |             |     |      |  |  |
| C3041        | 1-131-213-21 | tantalum                  | 0.47μF   | 10% | 35V  | C9101         | 1-130-108-11 | polypropylene | 0.015μF     | 20% | 125V |  |  |
| C3044        | 1-131-205-21 | tantalum                  | 2.2μF    | 10% | 25V  |               |              |               |             |     |      |  |  |
| C3049        | 1-131-212-21 | tantalum                  | 0.33μF   | 10% | 35V  |               |              |               |             |     |      |  |  |
| C3052        | 1-108-234-12 | mylar                     | 0.0047μF | 10% | 50V  |               |              |               |             |     |      |  |  |
| C3053        | 1-129-879-11 | polypropylene             | 0.047μF  | 5%  | 50V  |               |              |               |             |     |      |  |  |

#### NOTE:

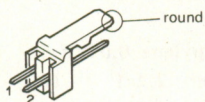
1. The shaded components are critical to safety.  
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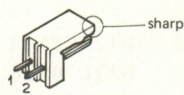
## CONNECTORS

Receptacles on the printed wiring board.

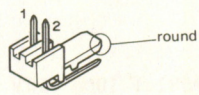
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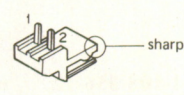
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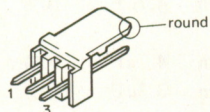
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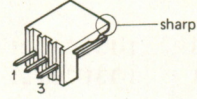
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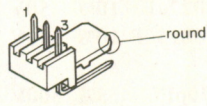
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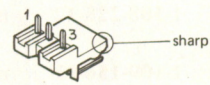
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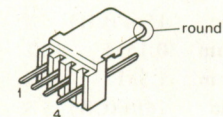
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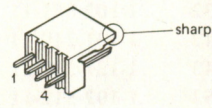
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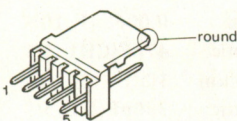
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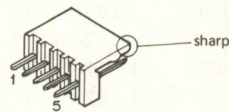
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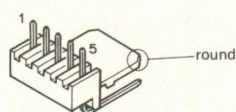
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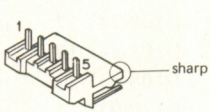
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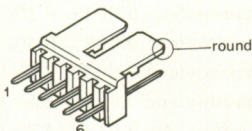
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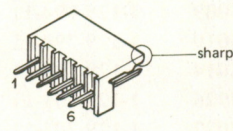
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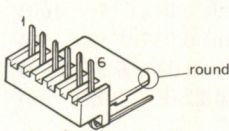
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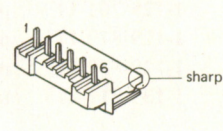
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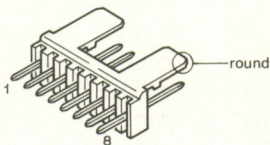
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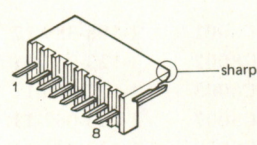
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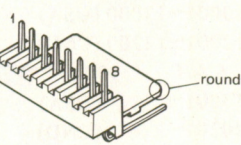
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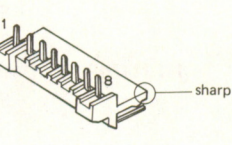
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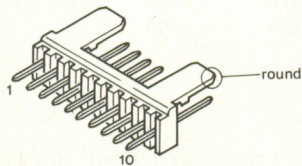
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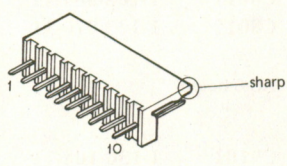
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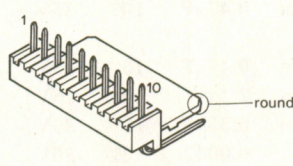
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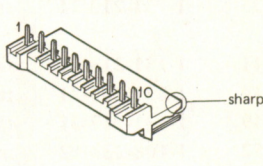
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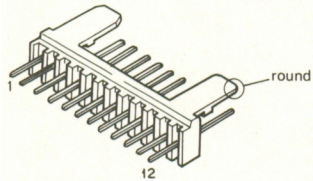
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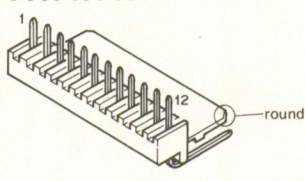
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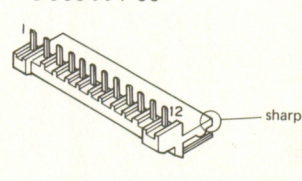
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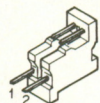
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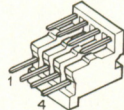
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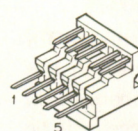
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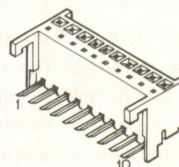
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1-508-914-00



1-561-104-00





| Ref. No.             | Part No.     | Description                     | Ref. No.          | Part No. | Description |
|----------------------|--------------|---------------------------------|-------------------|----------|-------------|
| <b>Frame</b>         |              |                                 | <b>DIODES</b>     |          |             |
| CN1                  | 1-509-639-00 | receptacle, 20P, female; REMOTE | <b>VY-1 board</b> |          |             |
| CN2                  | 1-509-095-00 | receptacle, 8P, female; TV      | D1001             |          | 10E-2       |
| CN3                  | 1-509-891-00 | receptacle, BNC; VIDEO IN       | D1002             |          | 10E-2       |
| CN4                  | 1-509-891-00 | receptacle, BNC; VIDEO OUT      | D1003             |          | 1S1555      |
| CN5                  | 1-507-251-XX | jack, JM-35 M-10; LINE IN       | D1004             |          | 1S1555      |
| CN6                  | 1-507-251-XX | jack, JM-35 M-10; LINE OUT      | D1005             |          | 1S1925P     |
| CN7                  | 1-507-410-21 | receptacle, F; RF OUT           | D1006             |          | 1S1555      |
| CN8                  | 1-509-841-00 | receptacle, 3P, female; AC OUT  | D1007             |          | 1S1555      |
| CN9                  | 1-534-692-00 | 3P AC cord                      | D1008             |          | 1S1555      |
| CN11                 | 1-561-034-00 | 10P; RF unit                    | D1009             |          | 1S1555      |
| CN12                 | 1-507-476-XX | jack, JM-60 M-15; HEADPHONES    | D1010             |          | 1S1555      |
| CN13                 | 1-507-251-XX | jack, JM-35 M-10; MIC           | D1011             |          | 1S1555      |
| <b>PW-17-3 board</b> |              |                                 | D1012             |          | 1S1555      |
| CN8002               | 1-508-638-XX | receptacle, 6P, male            | D1013             |          | RD6.8E-B    |
| <b>AC-8 board</b>    |              |                                 | D1014             |          | 1S1555      |
| CN9101               | 1-506-371-00 | receptacle, 2P, male            | <b>AU-7 board</b> |          |             |
|                      |              |                                 | D2001             |          | 1S1555      |
|                      |              |                                 | D2002             |          | 1S1555      |
|                      |              |                                 | D2003             |          | 10E-2       |
|                      |              |                                 | D2004             |          | 10E-2       |
|                      |              |                                 | D2005             |          | 1S1555      |
|                      |              |                                 | D2006             |          | 1S1555      |
|                      |              |                                 | D2007             |          | 1S1555      |
|                      |              |                                 | D2008             |          | 1S1555      |
|                      |              |                                 | D2009             |          | 10E-2       |
|                      |              |                                 | D2010             |          | 10E-2       |
|                      |              |                                 | D2011             |          | 10E-2       |
|                      |              |                                 | D2012             |          | 10E-2       |
|                      |              |                                 | D2013             |          | 10E-2       |

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| Ref. No.            | Part No. | Description     | Ref. No.             | Part No. | Description   |
|---------------------|----------|-----------------|----------------------|----------|---------------|
| <b>SV-7-2 board</b> |          |                 | <b>D5011</b>         |          | <b>1S1555</b> |
| <b>D3001</b>        |          | <b>1S1555</b>   | <b>D5012</b>         |          | <b>1S1555</b> |
| <b>D3002</b>        |          | <b>1S1555</b>   | <b>D5013</b>         |          | <b>1S1555</b> |
| <b>D3003</b>        |          | <b>1S1555</b>   | <b>D5014</b>         |          | <b>1S1555</b> |
| <b>D3004</b>        |          | <b>RD6.2E-B</b> | <b>D5015</b>         |          | <b>10E-2</b>  |
| <b>D3005</b>        |          | <b>1S1555</b>   | <b>D5016</b>         |          | <b>1S1555</b> |
| <b>D3006</b>        |          | <b>1S1555</b>   | <b>D5017</b>         |          | <b>10E-2</b>  |
| <b>D3007</b>        |          | <b>1S1555</b>   | <b>D5018</b>         |          | <b>10E-2</b>  |
| <b>D3008</b>        |          | <b>1S1555</b>   | <b>D5019</b>         |          | <b>1S1555</b> |
| <b>D3009</b>        |          | <b>1S1555</b>   | <b>D5020</b>         |          | <b>1S1555</b> |
| <b>D3010</b>        |          | <b>1S1555</b>   | <b>D5021</b>         |          | <b>1S1555</b> |
| <b>D3011</b>        |          | <b>1S1555</b>   | <b>D5022</b>         |          | <b>1S1555</b> |
| <b>D3012</b>        |          | <b>1S1555</b>   | <b>D5023</b>         |          | <b>10E-2</b>  |
| <b>D3013</b>        |          | <b>1S1555</b>   | <b>D5024</b>         |          | <b>10E-2</b>  |
| <b>D3014</b>        |          | <b>1S1555</b>   | <b>D5025</b>         |          | <b>10E-2</b>  |
| <b>D3015</b>        |          | <b>1S1555</b>   | <b>D5026</b>         |          | <b>1S1555</b> |
| <b>D3017</b>        |          | <b>1S1555</b>   | <b>D5029</b>         |          | <b>1S1555</b> |
| <b>D3018</b>        |          | <b>1S1555</b>   | <b>D5030</b>         |          | <b>1S1555</b> |
| <b>D3019</b>        |          | <b>1S1555</b>   | <b>D5031</b>         |          | <b>1S1555</b> |
|                     |          |                 | <b>D5032</b>         |          | <b>1S1555</b> |
| <b>CA-5 board</b>   |          |                 | <b>D5033</b>         |          | <b>1S1555</b> |
| <b>D3501</b>        |          | <b>1S1555</b>   | <b>D5034</b>         |          | <b>10E-2</b>  |
| <b>D3502</b>        |          | <b>1S1555</b>   | <b>D5035</b>         |          | <b>1S1555</b> |
| <b>D3503</b>        |          | <b>1S1555</b>   | <b>SY-25-2 board</b> |          |               |
| <b>D3504</b>        |          | <b>1S1555</b>   | <b>D6001</b>         |          | <b>1S1555</b> |
| <b>CR-5-2 board</b> |          |                 | <b>D6002</b>         |          | <b>1S1555</b> |
| <b>D4001</b>        |          | <b>1S1555</b>   | <b>D6003</b>         |          | <b>1S1555</b> |
| <b>SY-24 board</b>  |          |                 | <b>D6004</b>         |          | <b>1S1555</b> |
| <b>D5001</b>        |          | <b>10E-2</b>    | <b>D6005</b>         |          | <b>1S1555</b> |
| <b>D5002</b>        |          | <b>1S1555</b>   | <b>D6006</b>         |          | <b>1S1555</b> |
| <b>D5003</b>        |          | <b>10E-2</b>    | <b>D6007</b>         |          | <b>1S1555</b> |
| <b>D5004</b>        |          | <b>1S1555</b>   | <b>D6008</b>         |          | <b>1S1555</b> |
| <b>D5005</b>        |          | <b>10E-2</b>    | <b>D6009</b>         |          | <b>1S1555</b> |
| <b>D5006</b>        |          | <b>1S1555</b>   | <b>D6010</b>         |          | <b>1S1555</b> |
| <b>D5007</b>        |          | <b>10E-2</b>    |                      |          |               |
| <b>D5008</b>        |          | <b>1S1555</b>   |                      |          |               |
| <b>D5009</b>        |          | <b>1S1555</b>   |                      |          |               |
| <b>D5010</b>        |          | <b>1S1555</b>   |                      |          |               |

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| Ref. No.           | Part No. | Description       | Ref. No.             | Part No.     | Description |
|--------------------|----------|-------------------|----------------------|--------------|-------------|
| D6011              |          | 1S1555            | <b>PW-17-3 board</b> |              |             |
| D6012              |          | 1S1555            | D8001                |              | S5151R      |
| D6013              |          | 1S1555            | D8002                |              | UO5G        |
| D6014              |          | 1S1555            | D8003                |              | UO5G        |
| D6015              |          | 1S1555            | D8004                |              | S5151       |
|                    |          |                   | D8005                |              | RD6.2E-B    |
| D6016              |          | 1S1555            |                      |              |             |
| D6017              |          | 1S1555            | D8006                |              | UO5G        |
| D6018              |          | 1S1555            | D8007                |              | UO5G        |
| D6019              |          | 1S1555            | D8008                |              | S1RB10      |
| D6020              |          | 1S1555            | D8009                |              | 10E-2       |
|                    |          |                   | D8010                |              | 10E-2       |
| D6021              |          | 1S1555            | D8011                |              | 1S1555      |
| D6022              |          | 1S1555            |                      |              |             |
| D6023              |          | 1S1555            | <b>TL-2 board</b>    |              |             |
| D6024              |          | 1S1555            | D9051                |              | 1S1555      |
| D6025              |          | 1S1555            | D9052                |              | 1S1555      |
|                    |          |                   |                      |              |             |
| D6026              |          | 1S1555            |                      |              |             |
| D6027              |          | 1S1555            |                      |              |             |
|                    |          |                   |                      |              |             |
| LED6001            |          | TLR102-LE60 (red) |                      |              |             |
| LED6002            |          | TLR102-LE60 (red) |                      |              |             |
| LED6003            |          | TLR102-LE60 (red) |                      |              |             |
| LED6004            |          | TLR102-LR60 (red) |                      |              |             |
| LED6005            |          | TLR102-LE60 (red) |                      |              |             |
|                    |          |                   |                      |              |             |
| LED6006            |          | TLR102-LE60 (red) | <b>DELAY LINES</b>   |              |             |
| LED6007            |          | TLR102-LE60 (red) |                      |              |             |
|                    |          |                   |                      |              |             |
| <b>SY-30 board</b> |          |                   | <b>VY-1 board</b>    |              |             |
| D6501              |          | 1S1555            | DL1001               | 1-415-092-00 | 1H          |
| D6502              |          | RD3A              |                      |              |             |
| D6503              |          | 1S1555            | <b>CR-5-2 board</b>  |              |             |
| D6504              |          | 1S1555            | DL4001               | 1-415-065-00 | 1H          |
| D6505              |          | 1S1555            |                      |              |             |
|                    |          |                   |                      |              |             |
| D6506              |          | 1S1555            |                      |              |             |
| D6507              |          | 1S1555            |                      |              |             |
| D6508              |          | 1S1555            |                      |              |             |

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| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

## FUSES

### PW-17-3 board

|              |                     |    |        |
|--------------|---------------------|----|--------|
| <b>F8001</b> | <b>1-532-268-XX</b> | 2A | normal |
|--------------|---------------------|----|--------|

|              |                     |       |        |
|--------------|---------------------|-------|--------|
| <b>F8002</b> | <b>1-532-236-XX</b> | 0.63A | normal |
|--------------|---------------------|-------|--------|

|              |                     |    |        |
|--------------|---------------------|----|--------|
| <b>F8003</b> | <b>1-532-349-XX</b> | 4A | normal |
|--------------|---------------------|----|--------|

|       |              |       |        |
|-------|--------------|-------|--------|
| F8004 | 1-532-402-XX | 1.25A | normal |
|-------|--------------|-------|--------|

|       |              |      |        |
|-------|--------------|------|--------|
| F8005 | 1-532-401-XX | 0.8A | normal |
|-------|--------------|------|--------|

### AC-8 board

|              |                     |    |        |
|--------------|---------------------|----|--------|
| <b>F9101</b> | <b>1-532-268-XX</b> | 2A | normal |
|--------------|---------------------|----|--------|

## HEADS

### Frame

|    |              |                                              |
|----|--------------|----------------------------------------------|
| H1 | 8-829-368-00 | audio RP/audio erase/CTL RP<br>EPP-170-2102A |
| H2 | 8-825-701-00 | full erase EF135-21G                         |
| H3 | A-6762-009-A | video head disk ass'y (RSV-1A)               |

| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

## IC

### VY-1 board

|        |         |        |
|--------|---------|--------|
| IC1001 | CX-134A | (SONY) |
| IC1002 | CX-135A | (SONY) |
| IC1003 | CX-131A | (SONY) |

### SV-7-2 board

|        |           |           |
|--------|-----------|-----------|
| IC3001 | CX-138A   | (SONY)    |
| IC3002 | CX-143    | (SONY)    |
| IC3003 | CX-732    | (SONY)    |
| IC3004 | CX-143    | (SONY)    |
| IC3005 | TA7120P-C | (TOSHIBA) |

### CR-5-2 board

|        |         |        |
|--------|---------|--------|
| IC4001 | CX-133A | (SONY) |
| IC4002 | CX-136A | (SONY) |
| IC4003 | CX-150  | (SONY) |
| IC4004 | CX-137A | (SONY) |
| IC4005 | CX-145  | (SONY) |

### SY-24 board

|        |         |              |
|--------|---------|--------------|
| IC5001 | M51202L | (MITSUBISHI) |
|--------|---------|--------------|

### SY-25-2 board

|        |           |      |
|--------|-----------|------|
| IC6001 | SN74LS20N | (TI) |
| IC6002 | SN74LS20N | (TI) |
| IC6003 | SN74LS00N | (TI) |
| IC6004 | SN74LS04N | (TI) |
| IC6005 | SN74LS02N | (TI) |

### SY-30 board

|        |           |      |
|--------|-----------|------|
| IC6501 | SN74LS05N | (TI) |
| IC6502 | SN74LS10N | (TI) |
| IC6503 | SN74LS00N | (TI) |
| IC6504 | SN74LS04N | (TI) |
| IC6505 | SN74LS02N | (TI) |
| IC6506 | SN74LS03N | (TI) |

### TL-2 board

|        |        |
|--------|--------|
| IC9051 | CX-130 |
|--------|--------|

## NOTE:

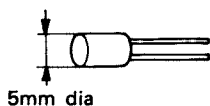
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## INDUCTORS

### MICRO INDUCTOR

1  $\mu$ H through 470  $\mu$ H

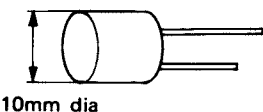


Part No. 1-407-□□□-XX

| Value     | Part No.<br>-□□□- | Value       | Part No.<br>-□□□- | Value      | Part No.<br>-□□□- | Value       | Part No.<br>-□□□- |
|-----------|-------------------|-------------|-------------------|------------|-------------------|-------------|-------------------|
| 1 $\mu$ H | 178               | 4.7 $\mu$ H | 186               | 22 $\mu$ H | 161               | 100 $\mu$ H | 169               |
| 1.2       | 179               | 5.6         | 187               | 27         | 162               | 120         | 170               |
| 1.5       | 180               | 6.8         | 188               | 33         | 163               | 150         | 171               |
| 1.8       | 181               | 8.2         | 189               | 39         | 164               | 180         | 172               |
| 2.2       | 182               | 10          | 157               | 47         | 165               | 220         | 173               |
| 2.7       | 183               | 12          | 158               | 56         | 166               | 270         | 174               |
| 3.3       | 184               | 15          | 159               | 68         | 167               | 330         | 175               |
| 3.9       | 185               | 18          | 160               | 82         | 168               | 390         | 176               |
|           |                   |             |                   |            |                   | 470         | 661               |

### MICRO INDUCTOR

470  $\mu$ H through 33 mH



Part No. 1-407-□□□-XX

| Value       | Part No.<br>-□□□- | Value  | Part No.<br>-□□□- | Value  | Part No.<br>-□□□- | Value | Part No.<br>-□□□- |
|-------------|-------------------|--------|-------------------|--------|-------------------|-------|-------------------|
| 470 $\mu$ H | 191               | 1.5 mH | 213               | 4.7 mH | 202               | 15 mH | 208               |
| 560         | 192               | 1.8    | 197               | 5.6    | 203               | 18    | 209               |
| 680         | 193               | 2.2    | 198               | 6.8    | 204               | 22    | 210               |
| 820         | 194               | 2.7    | 199               | 8.2    | 205               | 27    | 211               |
| 1 mH        | 195               | 3.3    | 200               | 10     | 206               | 33    | 212               |
| 1.2         | 196               | 3.9    | 201               | 12     | 207               |       |                   |

Ref. No. Part No. Description

#### Frame

L1 1-459-051-00 180 $\mu$ H; supply sensor  
L2 1-459-051-00 180 $\mu$ H; take-up sensor

Ref. No. Part No. Description

#### VY-1 board

L1003 1-407-575-00 VAR, 100 $\mu$ H  
L1005 1-407-575-00 VAR, 100 $\mu$ H  
L1006 1-407-269-00 VAR, 2.2mH  
L1007 1-407-269-00 VAR, 2.2mH

#### AU-7 board

L2003 1-407-240-00 VAR, 22mH  
L2005 1-407-286-00 VAR, 2.2mH

#### CR-5-2 board

L4005 1-407-570-00 VAR, 15 $\mu$ H

#### AC-8 board

L9101 1-421-225-00 line filter

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| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

## MOTORS

### Frame

|    |              |                        |
|----|--------------|------------------------|
| M1 | A-6050-009-A | drum ass'y; RS-9       |
| M2 | 8-835-007-00 | DC, DNF-1001C; CAPSTAN |
| M3 | 1-541-126-00 | DC, RF510T; THREADING  |

| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

## SOLENOIDS

### Frame

|     |              |       |
|-----|--------------|-------|
| PM1 | 1-454-173-00 | MAIN  |
| PM2 | 1-454-171-00 | EJECT |
| PM3 | 1-454-171-00 | REW   |
| PM4 | 1-454-171-00 | PLAY  |
| PM5 | 1-454-171-00 | FF    |
| PM6 | 1-454-172-00 | PINCH |
| PM7 | 1-454-185-00 | PAUSE |

## METERS

### Frame

|     |              |             |
|-----|--------------|-------------|
| ME1 | 1-520-190-21 | AUDIO LEVEL |
|-----|--------------|-------------|

## TRANSISTORS

### Frame

|     |         |              |
|-----|---------|--------------|
| Q11 | 2SC1116 | (PT-1 board) |
| Q12 | 2SD291  | (PT-1 board) |
| Q21 | 2SC1116 | (PT-2 board) |

### VY-1 board

|       |         |
|-------|---------|
| Q1001 | 2SK43-4 |
| Q1002 | 2SK43-4 |
| Q1003 | 2SC634A |
| Q1004 | 2SC403C |
| Q1005 | 2SC403C |

|       |         |
|-------|---------|
| Q1006 | 2SC403C |
| Q1007 | 2SC634A |
| Q1008 | 2SC634A |
| Q1009 | 2SA678  |
| Q1010 | 2SC634A |

|       |         |
|-------|---------|
| Q1011 | 2SC634A |
| Q1012 | 2SA678  |
| Q1013 | 2SC634A |
| Q1014 | 2SC634A |
| Q1015 | 2SC634A |

## LAMPS

### Frame

|     |              |                |
|-----|--------------|----------------|
| PL1 | 1-518-295-00 | 6V 10mA; POWER |
|-----|--------------|----------------|

### SY-25-2 board

|        |              |                   |
|--------|--------------|-------------------|
| PL6001 | 1-518-262-00 | 5V 60mA; AUTO-OFF |
|--------|--------------|-------------------|

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|-------------------|----------|---------------|---------------------|----------|-------------|
| Q1016             |          | 2SC634A       | <b>SV-7-2 board</b> |          |             |
| Q1017             |          | 2SC634A       | Q3001               |          | 2SC634A     |
| Q1018             |          | 2SC1364 (BLU) | Q3002               |          | 2SC634A     |
| Q1019             |          | 2SC634A       | Q3003               |          | 2SC634A     |
| Q1020             |          | 2SC1124       | Q3004               |          | 2SC634A     |
| Q1021             |          | 2SC634A       | Q3005               |          | 2SC634A     |
| Q1022             |          | 2SC403C       |                     |          |             |
| Q1023             |          | 2SC403C       | Q3006               |          | 2SC945-Q    |
| Q1024             |          | 2SC403C       | Q3007               |          | 2SC1061     |
| Q1025             |          | 2SC403C       | Q3008               |          | 2SA678      |
| Q1026             |          | 2SC403C       | Q3009               |          | 2SA671TD    |
| Q1028             |          | 2SC1364 (BLU) | Q3010               |          | 2SC634A     |
| <b>AU-7 board</b> |          |               | Q3011               |          | 2SC634A     |
| Q2001             |          | 2SC632A       | Q3012               |          | 2SC634A     |
| Q2002             |          | 2SC632A       | Q3013               |          | 2SC634A     |
| Q2003             |          | 2SC634A       | Q3014               |          | 2SC634A     |
| Q2004             |          | 2SC634A       | Q3015               |          | 2SC634A     |
| Q2005             |          | 2SC634A       |                     |          |             |
| Q2006             |          | 2SC634A       | Q3016               |          | 2SC634A     |
| Q2007             |          | 2SC632A       | Q3017               |          | 2SC634A     |
| Q2008             |          | 2SC634A       | Q3018               |          | 2SC634A     |
| Q2009             |          | 2SC634A       | Q3019               |          | 2SA678      |
| Q2010             |          | 2SC634A       | Q3020               |          | 2SC634A     |
|                   |          |               | Q3021               |          | 2SC1061     |
| Q2011             |          | 2SC634A       | Q3022               |          | 2SC634A     |
| Q2012             |          | 2SC634A       | Q3023               |          | 2SC634A     |
| Q2013             |          | 2SC632A       | Q3024               |          | 2SC634A     |
| Q2014             |          | 2SC632A       | Q3025               |          | 2SC634A     |
| Q2015             |          | 2SC634A       |                     |          |             |
| Q2016             |          | 2SC634A       | Q3026               |          | 2SC634A     |
| Q2017             |          | 2SA678        | Q3027               |          | 2SC634A     |
| Q2018             |          | 2SC634A       | Q3028               |          | 2SC634A     |
| Q2019             |          | 2SC1475       | Q3029               |          | 2SA678      |
| Q2020             |          | 2SC1475       | Q3030               |          | 2SC634A     |
|                   |          |               | <b>CA-5 board</b>   |          |             |
|                   |          |               | Q3501               |          | 2SA678      |
|                   |          |               | Q3502               |          | 2SC634A     |
|                   |          |               | Q3503               |          | 2SC634A     |
|                   |          |               | Q3504               |          | 2SC634A     |
|                   |          |               | Q3505               |          | 2SC634A     |

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|---------------------|----------|-------------|----------|----------|-------------|
| <b>CR-5-2 board</b> |          |             | Q5021    |          | 2SC1061     |
| Q4001               |          | 2SC403C     | Q5022    |          | 2SA678      |
| Q4002               |          | 2SC403C     | Q5023    |          | 2SC634A     |
| Q4003               |          | 2SC403C     | Q5024    |          | 2SC634A     |
| Q4004               |          | 2SC634A     | Q5025    |          | 2SA772-23   |
| Q4005               |          | 2SC634A     | Q5026    |          | 2SC1475     |
| Q4006               |          | 2SC634A     | Q5027    |          | 2SA772-23   |
| Q4007               |          | 2SC403C     | Q5028    |          | 2SC1475     |
| Q4008               |          | 2SC634A     | Q5029    |          | 2SC634A     |
| Q4009               |          | 2SC403C     | Q5030    |          | 2SC634A     |
| Q4010               |          | 2SC634A     | Q5031    |          | 2SC634A     |
| Q4011               |          | 2SC634A     | Q5032    |          | 2SC634A     |
| Q4012               |          | 2SC634A     | Q5033    |          | 2SC1475     |
| <b>SY-24 board</b>  |          |             | Q5034    |          | 2SC634A     |
| Q5001               |          | 2SC1475     | Q5035    |          | 2SC634A     |
| Q5002               |          | 2SC1475     | Q5036    |          | 2SC1061     |
| Q5003               |          | 2SC1475     | Q5037    |          | 2SC634A     |
| Q5004               |          | 2SC1475     | Q5038    |          | 2SC634A     |
| Q5005               |          | 2SC634A     | Q5039    |          | 2SA678      |
| Q5006               |          | 2SC634A     | Q5040    |          | 2SC634A     |
| Q5007               |          | 2SC634A     | Q5041    |          | 2SA893      |
| Q5008               |          | 2SA678      | Q5042    |          | 2SC634A     |
| Q5009               |          | 2SC634A     | Q5043    |          | 2SC634A     |
| Q5010               |          | 2SC634A     | Q5044    |          | 2SC634A     |
| Q5011               |          | 2SC634A     | Q5045    |          | 2SC634A     |
| Q5012               |          | 2SC634A     | Q5046    |          | 2SC634A     |
| Q5013               |          | 2SA678      | Q5047    |          | 2SC634A     |
| Q5014               |          | 2SC634A     | Q5048    |          | 2SC634A     |
| Q5015               |          | 2SC634A     | Q5049    |          | 2SC634A     |
| Q5016               |          | 2SC634A     | Q5050    |          | 2SC634A     |
| Q5017               |          | 2SA772-23   | Q5051    |          | 2SC634A     |
| Q5018               |          | 2SC634A     | Q5052    |          | 2SC634A     |
| Q5019               |          | 2SC634A     | Q5053    |          | 2SC634A     |
| Q5020               |          | 2SA678      | Q5054    |          | 2SC634A     |

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|---------------|----------|---------------|---------------|----------|-------------|
| Q5055         |          | 2SC634A       | Q6506         |          | 2SA678      |
| Q5056         |          | 2SC1475       | Q6507         |          | 2SC634A     |
| Q5057         |          | 2SC634A       | Q6508         |          | 2SC634A     |
| Q5058         |          | 2SC634A       | Q6509         |          | 2SC634A     |
| Q5059         |          | 2SC1475       | Q6510         |          | 2SC634A     |
| Q5060         |          | 2SC634A       | Q6511         |          | 2SC634A     |
| Q5061         |          | 2SC1475       | Q6512         |          | 2SC634A     |
| SY-25-2 board |          |               | Q6513         |          | 2SC634A     |
| Q6001         |          | 2SC634A       | Q6514         |          | 2SC634A     |
| Q6002         |          | 2SC634A       | Q6515         |          | 2SC634A     |
| Q6003         |          | 2SC634A       | Q6516         |          | 2SC634A     |
| Q6004         |          | 2SC634A       | Q6517         |          | 2SC634A     |
| Q6005         |          | 2SC634A       | Q6518         |          | 2SC634A     |
| Q6006         |          | 2SA678        | Q6519         |          | 2SC634A     |
| Q6007         |          | 2SC634A       | Q6520         |          | 2SC634A     |
| Q6008         |          | 2SC1364 (BLU) | Q6521         |          | 2SC634A     |
| Q6009         |          | 2SA634A       | Q6522         |          | 2SC634A     |
| Q6010         |          | 2SC634A       | Q6523         |          | 2SC634A     |
| Q6011         |          | 2SC1475       | PW-17-3 board |          |             |
| Q6012         |          | 2SC634A       | Q8001         |          | 2SC1475     |
| Q6013         |          | 2SC634A       | Q8002         |          | 2SC634A     |
| Q6014         |          | 2SC634A       | Q8003         |          | 2SC634A     |
| Q6015         |          | 2SC634A       | Q8004         |          | 2SC634A     |
| Q6016         |          | 2SC634A       | Q8007         |          | 2SC634A     |
| Q6017         |          | 2SC634A       |               |          |             |
| Q6018         |          | 2SC634A       |               |          |             |
| Q6019         |          | 2SC1364 (BLU) |               |          |             |
| Q6020         |          | 2SC1364 (BLU) |               |          |             |
| SY-30 board   |          |               |               |          |             |
| Q6501         |          | 2SC634A       |               |          |             |
| Q6502         |          | 2SC634A       |               |          |             |
| Q6503         |          | 2SA678        |               |          |             |
| Q6504         |          | 2SA678        |               |          |             |
| Q6505         |          | 2SC634A       |               |          |             |

**NOTE:**

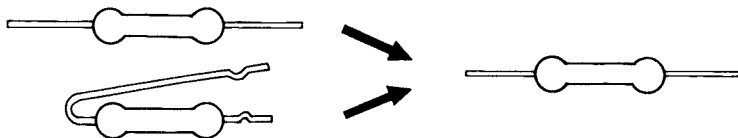
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## RESISTORS

### CARBON RESISTOR

± 5%, 1/4W, non-special type  
1 Ω through 1 MΩ



Part No. 1-246-□□□-15

| Value | Part No.<br>-□□□- | Value | Part No.<br>-□□□- | Value | Part No.<br>-□□□- | Value  | Part No.<br>-□□□- |
|-------|-------------------|-------|-------------------|-------|-------------------|--------|-------------------|
| 1 Ω   | 401               | 33 Ω  | 437               | 1 kΩ  | 473               | 33 kΩ  | 509               |
| 1.1   | 402               | 36    | 438               | 1.1   | 474               | 36     | 510               |
| 1.2   | 403               | 39    | 439               | 1.2   | 475               | 39     | 511               |
| 1.3   | 404               | 43    | 440               | 1.3   | 476               | 43     | 512               |
| 1.5   | 405               | 47    | 441               | 1.5   | 477               | 47     | 513               |
| 1.6   | 406               | 51    | 442               | 1.6   | 478               | 51     | 514               |
| 1.8   | 407               | 56    | 443               | 1.8   | 479               | 56     | 515               |
| 2     | 408               | 62    | 444               | 2     | 480               | 62     | 516               |
| 2.2   | 409               | 68    | 445               | 2.2   | 481               | 68     | 517               |
| 2.4   | 410               | 75    | 446               | 2.4   | 482               | 75     | 518               |
| 2.7   | 411               | 82    | 447               | 2.7   | 483               | 82     | 519               |
| 3     | 412               | 91    | 448               | 3.0   | 484               | 91     | 520               |
| 3.3   | 413               | 100 Ω | 449               | 3.3   | 485               | 100 kΩ | 521               |
| 3.6   | 414               | 110   | 450               | 3.6   | 486               | 110    | 522               |
| 3.9   | 415               | 120   | 451               | 3.9   | 487               | 120    | 523               |
| 4.3   | 416               | 130   | 452               | 4.3   | 488               | 130    | 524               |
| 4.7   | 417               | 150   | 453               | 4.7   | 489               | 150    | 525               |
| 5.1   | 418               | 160   | 454               | 5.1   | 490               | 160    | 526               |
| 5.6   | 419               | 180   | 455               | 5.6   | 491               | 180    | 527               |
| 6.2   | 420               | 200   | 456               | 6.2   | 492               | 200    | 528               |
| 6.8   | 421               | 220   | 457               | 6.8   | 493               | 220    | 529               |
| 7.5   | 422               | 240   | 458               | 7.5   | 494               | 240    | 530               |
| 8.2   | 423               | 270   | 459               | 8.2   | 495               | 270    | 531               |
| 9.1   | 424               | 300   | 460               | 9.1   | 496               | 300    | 532               |
| 10 Ω  | 425               | 330   | 461               | 10 kΩ | 497               | 330    | 533               |
| 11    | 426               | 360   | 462               | 11    | 498               | 360    | 534               |
| 12    | 427               | 390   | 463               | 12    | 499               | 390    | 535               |
| 13    | 428               | 430   | 464               | 13    | 500               | 430    | 536               |
| 15    | 429               | 470   | 465               | 15    | 501               | 470    | 537               |
| 16    | 430               | 510   | 466               | 16    | 502               | 510    | 538               |
| 18    | 431               | 560   | 467               | 18    | 503               | 560    | 539               |
| 20    | 432               | 620   | 468               | 20    | 504               | 620    | 540               |
| 22    | 433               | 680   | 469               | 22    | 505               | 680    | 541               |
| 24    | 434               | 750   | 470               | 24    | 506               | 750    | 542               |
| 27    | 435               | 820   | 471               | 27    | 507               | 820    | 543               |
| 30    | 436               | 910   | 472               | 30    | 508               | 910    | 544               |
|       |                   |       |                   |       |                   | 1 MΩ   | 545               |

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| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

All resistors are in ohms.

#### VY-1 board

|       |              |                    |
|-------|--------------|--------------------|
| R1011 | 1-213-127-11 | metal 47 5% 1W     |
| R1016 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R1018 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R1029 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R1053 | 1-224-249-XX | VAR, metal 1K(B)   |

|       |              |                   |
|-------|--------------|-------------------|
| R1083 | 1-244-858-11 | carbon 240 5% ½W  |
| R1085 | 1-244-858-11 | carbon 240 5% ½W  |
| R1102 | 1-224-248-XX | VAR, metal 470(B) |
| R1113 | 1-224-248-XX | VAR, metal 470(B) |
| R1126 | 1-224-249-XX | VAR, metal 1K(B)  |

|       |              |                    |
|-------|--------------|--------------------|
| R1150 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R1158 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R1161 | 1-224-250-XX | VAR, metal 2.2K(B) |
| R1164 | 1-224-251-XX | VAR, metal 4.7K(B) |

#### AU-7 board

|       |              |                    |
|-------|--------------|--------------------|
| R2046 | 1-224-249-XX | VAR, metal 1K(B)   |
| R2054 | 1-224-253-XX | VAR, metal 22K(B)  |
| R2071 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R2074 | 1-224-253-XX | VAR, metal 22K(B)  |
| R2090 | 1-217-383-11 | fusible 4.7 5% ¼W  |

#### SV-7-2 board

|       |              |                   |
|-------|--------------|-------------------|
| R3012 | 1-224-254-XX | VAR, metal 47K(B) |
| R3014 | 1-224-254-XX | VAR, metal 47K(B) |
| R3015 | 1-212-641-11 | metal 130 5% ¼W   |
| R3027 | 1-214-162-11 | metal 18K 1% ¼W   |
| R3028 | 1-224-254-XX | VAR, metal 47K(B) |

|       |              |                       |
|-------|--------------|-----------------------|
| R3029 | 1-214-170-11 | metal 39K 1% ¼W       |
| R3030 | 1-214-162-11 | metal 18K 1% ¼W       |
| R3039 | 1-207-645-11 | wirewound 0.47 10% 3W |
| R3040 | 1-224-254-XX | VAR, metal 47K(B)     |
| R3050 | 1-224-254-XX | VAR, metal 47K(B)     |

|       |              |                               |
|-------|--------------|-------------------------------|
| R3086 | 1-224-253-XX | VAR, metal 22K(B)             |
| R3087 | 1-214-175-11 | metal 62K 1% ¼W               |
| R3088 | 1-214-170-11 | metal 39K 1% ¼W               |
| R3101 | 1-211-401-11 | carbon nonflammable 4.7 5% ½W |
| R3128 | 1-224-251-XX | VAR, metal 4.7K(B)            |
| R3133 | 1-210-830-11 | carbon 5.6M 5% ¼W             |

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| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

#### CR-5-2 board

|       |              |                    |
|-------|--------------|--------------------|
| R4007 | 1-224-253-XX | VAR, metal 22K(B)  |
| R4014 | 1-224-249-XX | VAR, metal 1K(B)   |
| R4022 | 1-224-251-XX | VAR, metal 4.7K(B) |
| R4032 | 1-224-249-XX | VAR, metal 1K(B)   |
| R4034 | 1-224-249-XX | VAR, metal 1K(B)   |

|       |              |                  |
|-------|--------------|------------------|
| R4046 | 1-224-249-XX | VAR, metal 1K(B) |
| R4056 | 1-213-136-11 | metal 270 5% 1W  |
| R4075 | 1-224-249-XX | VAR, metal 1K(B) |

#### SY-24 board

|       |              |                    |
|-------|--------------|--------------------|
| R5086 | 1-224-249-XX | VAR, metal 1K(B)   |
| R5104 | 1-224-256-XX | VAR, metal 220K(B) |

#### PW-17-3 board

|       |              |                  |
|-------|--------------|------------------|
| R8005 | 1-224-249-XX | VAR, metal 1K(B) |
|-------|--------------|------------------|

#### CP-12 board

|       |              |                          |
|-------|--------------|--------------------------|
| R8501 | 1-224-540-00 | VAR, 100K(B) ; TRACKING  |
| R8502 | 1-224-694-XX | VAR, 20K(A); AUDIO LEVEL |

#### HE-1 board

|       |              |                             |
|-------|--------------|-----------------------------|
| R9701 | 1-217-071-11 | wirewound 27 10% 5W; HEATER |
|-------|--------------|-----------------------------|

## RELAYS

#### VY-1 board

|        |              |          |
|--------|--------------|----------|
| RY1001 | 1-515-198-00 | 12V 250Ω |
| RY1002 | 1-515-198-00 | 12V 250Ω |



| Ref. No.          | Part No.            | Description      |
|-------------------|---------------------|------------------|
| <b>AU-7 board</b> |                     |                  |
| <b>RY2001</b>     | <b>1-515-273-00</b> | 12V 250 $\Omega$ |
| <b>RY2002</b>     | <b>1-515-223-21</b> | 12V 400 $\Omega$ |

**PW-17-3 board**

|               |                     |                  |
|---------------|---------------------|------------------|
| <b>RY8001</b> | <b>1-515-223-21</b> | 12V 400 $\Omega$ |
|---------------|---------------------|------------------|

| Ref. No.           | Part No.            | Description                |
|--------------------|---------------------|----------------------------|
| <b>CP-12 board</b> |                     |                            |
| <b>S8501</b>       | <b>1-516-994-00</b> | lever slide ; INPUT SELECT |
| <b>S8502</b>       | <b>1-516-994-00</b> | lever slide ; LIMITER      |

## SWITCHES

**Frame**

|           |                     |                  |
|-----------|---------------------|------------------|
| <b>S1</b> | <b>1-516-698-00</b> | push ; POWER     |
| <b>S2</b> | <b>1-548-514-XX</b> | counter with sw  |
| <b>S3</b> | <b>1-516-520-00</b> | micro ; MISS REC |

**SY-24 board**

|              |                     |       |
|--------------|---------------------|-------|
| <b>S5001</b> | <b>1-514-722-XX</b> | micro |
| <b>S5002</b> | <b>1-514-722-XX</b> | micro |

**SY-25-2 board**

|              |                     |                           |
|--------------|---------------------|---------------------------|
| <b>S6001</b> | <b>1-552-151-00</b> | key ; FF                  |
| <b>S6002</b> | <b>1-552-150-00</b> | key ; PLAY                |
| <b>S6003</b> | <b>1-552-154-00</b> | key ; STOP                |
| <b>S6004</b> | <b>1-552-148-00</b> | key ; REW                 |
| <b>S6005</b> | <b>1-552-147-00</b> | key ; EJECT               |
| <b>S6006</b> | <b>1-552-149-00</b> | key ; PAUSE               |
| <b>S6007</b> | <b>1-552-159-00</b> | rotary ; PGM'ED OPERATION |
| <b>S6008</b> | <b>1-552-159-00</b> | rotary ; TIMER PLAY       |
| <b>S6009</b> | <b>1-552-152-00</b> | key ; REC                 |
| <b>S6010</b> | <b>1-552-153-00</b> | key ; DUB                 |

## TRANSFORMERS

**Frame**

|           |                     |       |
|-----------|---------------------|-------|
| <b>T1</b> | <b>1-442-844-00</b> | POWER |
|-----------|---------------------|-------|

**VY-1 board**

|              |                     |              |
|--------------|---------------------|--------------|
| <b>T1001</b> | <b>1-425-704-00</b> | RF INPUT     |
| <b>T1002</b> | <b>1-425-704-00</b> | RF INPUT     |
| <b>T1003</b> | <b>1-415-086-00</b> | EQT-4        |
| <b>T1004</b> | <b>1-415-085-00</b> | EQT-3        |
| <b>T1005</b> | <b>1-425-714-00</b> | RF OUTPUT    |
| <b>T1006</b> | <b>1-409-281-00</b> | TRAP 3.58MHz |
| <b>T1007</b> | <b>1-415-084-00</b> | EQT-2        |
| <b>T1008</b> | <b>1-409-280-00</b> | TRAP         |
| <b>T1009</b> | <b>1-415-083-00</b> | EQT-1        |
| <b>T1010</b> | <b>1-415-083-00</b> | EQT-1        |

**AU-7 board**

|              |                     |        |
|--------------|---------------------|--------|
| <b>T2001</b> | <b>1-427-284-00</b> | OUTPUT |
| <b>T2002</b> | <b>1-405-670-00</b> | OSC    |

**SV-7-2 board**

|              |                     |              |
|--------------|---------------------|--------------|
| <b>T3001</b> | <b>1-427-265-00</b> | noise filter |
|--------------|---------------------|--------------|

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|----------|----------|-------------|
|----------|----------|-------------|

#### CR-5-2 board

|       |              |       |
|-------|--------------|-------|
| T4001 | 1-411-100-00 | BPT-1 |
| T4002 | 1-425-785-00 | BAT   |
| T4003 | 1-411-101-00 | BPT-2 |
| T4004 | 1-411-102-00 | BPT-3 |
| T4005 | 1-405-669-00 | PST   |
| T4006 | 1-411-104-00 | BPT-5 |
| T4007 | 1-405-667-00 | OSC   |
| T4008 | 1-411-103-00 | BPT-4 |
| T4009 | 1-405-666-00 | OSC   |

#### THERMISTORS

##### VY-1 board

|        |              |     |
|--------|--------------|-----|
| TH1001 | 1-800-200-XX | S3K |
|--------|--------------|-----|

##### AU-7 board

|        |              |     |
|--------|--------------|-----|
| TH2001 | 1-800-200-XX | S3K |
|--------|--------------|-----|

##### CR-5-2 board

|        |              |       |
|--------|--------------|-------|
| TH4001 | 1-800-202-XX | S-10K |
|--------|--------------|-------|

| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

#### CRYSTALS

##### SV-7-2 board

|       |              |           |
|-------|--------------|-----------|
| X3001 | 1-527-245-00 | 31.468kHz |
|-------|--------------|-----------|

##### CR-5-2 board

|       |              |             |
|-------|--------------|-------------|
| X4001 | 1-527-154-00 | 3.579545MHz |
| X4002 | 1-527-185-00 | 3.579545MHz |
| X4003 | 1-527-244-00 | 3.575611MHz |

#### MISCELLANEOUS

|              |                     |
|--------------|---------------------|
| 1-586-633-00 | Condensation Sensor |
|--------------|---------------------|

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|----------|----------|-------------|
|----------|----------|-------------|

## PACKING AND ACCESSORIES

|                     |                                                        |
|---------------------|--------------------------------------------------------|
| 1-417-063-00        | Transformer, antenna matching<br>(75Ω to 300Ω) EAC-24W |
| 1-516-444-00        | Switch, antenna (ANS-20)                               |
| 1-534-763-21        | Coaxial Cable Ass'y (0.5m)                             |
| <b>1-506-305-00</b> | <b>Plug, F</b>                                         |
| 1-534-763-41        | Coaxial Cable Ass'y (1.5m)                             |
| <b>1-506-305-00</b> | <b>Plug, F</b>                                         |
| <b>3-653-548-00</b> | <b>Spacer</b>                                          |
| <b>3-653-570-00</b> | <b>Bag, poly (for SLO-320)</b>                         |
| <b>3-654-740-00</b> | <b>Carton, individual</b>                              |
| <b>3-654-741-00</b> | <b>Stopper</b>                                         |
| <b>3-654-742-00</b> | <b>Cushion (LEFT)</b>                                  |
| <b>3-654-743-00</b> | <b>Cushion (RIGHT)</b>                                 |
| 3-654-746-00        | Cover, dust                                            |
| 3-654-748-00        | Spacer, plug                                           |
| <b>3-701-630-00</b> | <b>Bag, poly (for manual)</b>                          |
| <b>3-770-370-21</b> | <b>Manual, instruction (USA)</b>                       |
| <b>3-770-370-31</b> | <b>Manual, instruction (CND)</b>                       |
| <b>3-794-131-21</b> | <b>Card, instruction (USA)</b>                         |
| <b>3-794-131-31</b> | <b>Card, instruction (CND)</b>                         |
| Standard products   | Video Cassette Tape (L-250)                            |

| Ref. No. | Part No. | Description |
|----------|----------|-------------|
|----------|----------|-------------|

## JIGS

|                     |                                         |
|---------------------|-----------------------------------------|
| <b>J-600-182-0A</b> | <b>Drum Eccentricity Gauge (3)</b>      |
| <b>J-600-183-0A</b> | <b>Drum Eccentricity Gauge (2)</b>      |
| <b>J-600-184-0A</b> | <b>Drum Eccentricity Gauge (1)</b>      |
| <b>J-608-657-0A</b> | <b>Reference Flat Plate</b>             |
| <b>J-608-700-0A</b> | <b>Drum Eccentricity Gauge (5)</b>      |
| <b>J-6080-002-A</b> | <b>FWD Back Tension Measurement Jig</b> |
| <b>J-6080-011-A</b> | <b>Reel Table Tension Gauge</b>         |
| <b>J-6080-013-1</b> | <b>Dihedral Adjusting Screws</b>        |
| <b>Y-2031-001-0</b> | <b>Cleaning Fluid</b>                   |
| <b>2-034-697-00</b> | <b>Chamois</b>                          |
| <b>7-732-050-20</b> | <b>Tension Scale ( 50g full scale)</b>  |
| <b>7-732-050-30</b> | <b>Tension Scale (100g full scale)</b>  |
| <b>7-723-902-01</b> | <b>Inspection mirror (handle)</b>       |
| <b>7-723-902-11</b> | <b>Inspection mirror (mirror)</b>       |
| <b>8-969-995-01</b> | <b>Alignment Tape (KR5-1)</b>           |
| <b>9-911-053-00</b> | <b>Thickness Gauge</b>                  |
| Standard products   | Head Demagnetizer<br>(HE-2 or HE-3)     |

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